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AMMONIA, AND THE STIMULATIVE SYSTEM OF TREATMENT IN DISEASE.*

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THE subject of my paper is, "Ammonia: its Uses in Practice; with a Consideration of the Stimulative System of Treatment in Disease."

Thus ammonia is, as it were, my text, and while speaking of this agent it must be understood that I refer to those compounds of ammonia which contain it in a free state, or from which it can be readily formed in the system; mainly I refer, unless otherwise indicated, to liquor ammonia and ammonia carbonate.

First, let us briefly consider the effects of ammonia in overdoses, toxicologically.

(*a.*) If large quantities of free ammonia are inhaled by animal or man, death immediately results, usually from Asphyxia, owing to arrest of the respiratory function—not simply from the fact of its being an irrespirable gas, but by virtue of its inducing sudden paralysis of the brain. If the quantity inhaled is not sufficient to cause death, temporary paralysis and insensibility result. The remote effects of such inhalation may be unimportant; on the contrary, they may be grave, and especially so in animals which respire orally, and in which the mouth happens to be open at the time of inhalation. In this case, the irritant

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effects of the gas may be exerted locally in the mouth, as well as on the Schneiderian membrane; but, worse than either, it may produce rapid swelling of the epiglottis and death by Asphyxia; or more remotely, it may cause extensive and fatal Bronchitis, or even Broncho-pneumonia.

If the gas is comparatively diluted, Broncho-nasal Catarrh of a mild type may be the only result.

(*b.*) If strong solution of ammonia is introduced into the mouth and stomach, it produces all the effects of corrosive alkaline agents generally. It destroys the integrity of the buccal, œsophageal, and gastric mucous membranes. That of the mouth, from at first being shrivelled and somewhat blanched, rapidly becoming intensely inflamed—thickened to the extent, in some cases, of half or three-quarters of an inch, of a deep red colour, its epithelium raised in the form of vesicles, and ultimately peeling off in large masses, especially on the application of friction.

The papillæ are intensely injected, the tongue swollen, large quantities of saliva and mucus are thrown out, become ropy, and render the organ very slippery and difficult of retention by the hand.

Frequently the faucial mucous membrane, and that of the epiglottis, is so œdematous as to produce stertor, Dysphagia, and difficult respiration. Violent coughing, ejection of large quantities of bloody saliva and mucus, with vomition (in animals which vomit) are also seen, the vomit usually containing bloody serum and shreds of epithelium.

The condition of the membrane of the mouth is an index to that of the stomach, and, to a less extent, of the œsophagus; but there is another condition noted in the stomach—viz., that independently of the membrane being softened, the ammonia by its diffusive properties has penetrated the coats of the capillaries and small veins in the immediate vicinity, and caused solution of the hæmato-globulin and destruction of the red cells. After death, too, it has been noted that the blood itself is deficient in coagulable power; it is not, however, increased in alkalinity, neither is the urine alkaline.

The same effects have been observed in the small intestines,

and that, too, in a somewhat modified degree, when ammonia has been injected into the peritoneal cavity.

Enteralgia, rapid breathing, and gradual failure of the pulse are also accompaniments of ammonia-poisoning.

(*c.*) If strong ammonia is injected into the veins, we have, as its *immediate* effect, sudden convulsions, complete loss of voluntary power, paralysis, stertorous breathing, and dilatation of the pupils. If the quantity has been large, death quickly follows; otherwise the animal, after lying perfectly still or somewhat convulsed for about twenty minutes or half an hour, regains consciousness and sensibility, rises without any confusion of intellect, and seeks for food.

Its remote effects are due to the powerful solvent action it exerts on the blood, and to the lowering of the density of that fluid; and probably, in some degree, to interference with the integrity of the blood-vessels: the remote effects are systemic hæmorrhages and effusions, Hæmaturia, and Diarrhœa. If the integrity of the blood has been too far interfered with, the animal ultimately dies from Anæmia.

Physiologically, ammonia acts as a powerful stimulant, but does not, like alcohol, increase mental activity, nor does it to the same extent increase the force of the circulation. In man it is found to impart a feeling of greater strength, with a sensation of warmth in the epigastrium, and of the system generally, with increased renal and cutaneous elimination. Its action as a stimulant—owing to its being so quickly expelled by the various excretory channels—is as fugitive as it is rapid, but it does not produce so much secondary depression as alcohol.

Its elimination by the skin and lungs has been pointed out by Dr. Richardson, who tells us that in the case of fellmongers, who are constantly inhaling ammonia, a powerful ammoniacal odour is exhaled from the body, and that ammonia in small quantities can always be detected in the expired air.

Whether ammonia be given experimentally or therapeutically for any length of time, it induces catarrh of the intestines, and, as a result of this, Diarrhœa.

Ammonia is not only a general stimulant in health, it is more powerfully so in disease, and, in addition, it is a special respira-

tory and cardiac stimulant—acting probably on the respiratory and cardiac centres in the brain, in addition to the nerve ganglia of the lungs and heart respectively.

It is, too, a powerful stimulant to all the glands of the body, as well as to the mucous glands generally, acting upon the mucous membrane of the alimentary tract, upon the kidneys, the skin, and the liver. Its action upon the liver appears to me to have been but very slightly, if at all, recognised by therapeutists.

Its effects as a general gland stimulant are well seen in those cases where the pulse is firm, the skin dry, the kidneys inactive, the mucous membranes icteric, the bowels sluggish, and the fæces coated with mucus, with a hot, dry, and furred condition of the mouth. A few full doses of ammonia here will, by stimulating gland function, rapidly alter these conditions. In the stomach and intestines ammonia acts as an antacid and as an anti-tympanitic. It is a powerful antiseptic, both externally and internally, and will preserve freshly-drawn blood for an indefinite period.

It is, both by digestion and inhalation, an anti-spasmodic, and indirectly an anodyne.

It is a solvent, and destroys or neutralizes, physiologically or chemically, animal vires, and counteracts the lowering effects of sedative poisons. It, indirectly, lowers temperature.

Having glanced at the general effects of ammonia on the system, let us see to what purposes we can apply it in practice, and with what other therapeutic agents we can advantageously combine it.

As a general and gland stimulant, it is indicated in all conditions, febrile or otherwise, of the system in which the vital powers are at a low ebb. It is invaluable in almost every form of Influenza; in collapse, whether resulting from loss of blood exhaustion, parturition, prolonged and inordinate excitement exposure, drowning, poisoning, shock, lightning, effects of fire sedative or narcotic medicines.

As it does not act as a food (though restorative in a sense), it should, for the purposes above mentioned, be combined with alcohol and other easily assimilable and nutritive materials, and being transient in its effect, should be repeated with tolerable frequency.

It is useful in acute or sub-acute indigestion in horses or cattle, when purgatives fail to act, and the animal shows signs of exhaustion, alternated with strychnine or nux vomica ; or, if there is much pain, combined with opium.

In the early stages of tympany, the liquor or the carbonate unite with the liberated carbonic acid and fix it, and in any stage are beneficial by stimulating the mucous membrane to increased activity, by rousing the nervous energy, and by arresting and preventing decomposition.

In indigestion, with acidity and Diarrhœa, it acts as an antacid as well as an anti-tympanitic and gastric stimulant, and, for these reasons, it has been particularly recommended by the late Mr. Aitken, of Kilmarnock, and by Mr. Steel, of Biggar, in that form of indigestion known as White Skit or White Scour in calves.

In all fevers it may be combined or alternated with potassic chlorate, nitrate, or sulphate, or with magnesium sulphate; and in those fevers accompanied by great exaltation of the circulation and of the temperature, aconite may be employed with ammonia with the best results. If the carbonate is used in the form of bolus, the tincture may be dropped into the ball ; if in solution, it should be either alternated with the ammonia or given in the drinking water : on no account should it be given with ammonia in the form of draught.

Where there is a tendency to malignancy or putrefaction—as in Distemper in the dog, and some of the forms of fever occasionally met with in the horse—and in all septic blood affections, ammonia should be combined with camphor, quinine, or cinchona, in addition to potassic chlorate, or alternated with the sulphites ; and where the respiratory or cardiac centres are failing, with it nux vomica and alcohol ; or, when the cardiac centre is more particularly involved, with digitalis.

With alcohol and spt. ether nit., it is invaluable in the earlier stage of Pleurisy (in cattle I have even combined it with turpentine), and in the later stages, when effusion is threatened or the pulse and respiration are failing, also with alcohol and, in addition, potassic iodide. With the latter agent it is also extremely useful, when effusion is an accomplished fact (not only

in effusion into the thorax, but into the pericardial and abdominal cavities); and it enhances its action to a degree that would scarcely be credited by those who have not employed it for this purpose.

As it is invaluable in the early or congestive stages of Pleurisy, so also in Pneumonia, and in its exudative stage, particularly in septic, metastatic and asthenic forms generally. In Bronchitis, as an expectorant and respiratory stimulant, it is particularly indicated in low forms of the disease, when the mucous secretion is suppressed and when the respiratory function is languid or shows signs of exhaustion; and in the last stages of all forms of the disease it may be combined here with ipecachuana, alcohol, camphor, and other agents, as circumstances demand.

In practice, especially in large towns, we meet with a class of cases to which no other designation than *Congestive Fever* (the one I have usually given it) so aptly applies—a condition marked by great excitement or, indifferently, prostration; by an oppressive or hard pulse, hurried respiration, unequal external and somewhat elevated internal temperature; injected or yellow mucous membranes, torpid bowels, scanty urine; uneasiness, as expressed by constantly shifting the legs, occasionally pawing, and oftentimes colicy pains; perspiration, shivering, and muscular twitchings: a condition of system, in fact, of the terminations of which the practitioner is for a time ignorant, and for which he must be carefully and anxiously on the watch—it may be Laminitis, Pulmonary Congestion, Acute Œdema, Uræmia, Enteritis. Under such circumstances, I say ammonia, in bold doses, with external stimulants and other adjuvants, is particularly valuable.

Ammonia is, *par excellence*, the agent upon which we can rely in our combats with *ante-mortem* cardiac clotting and systemic thrombosis. I will not go so far as Dr. Richardson, and say that ammonia will disperse clots when they are thoroughly formed; but I will say that no other agent possesses the same power of preventing the formation of thrombi, or, when formed, in assisting in their subsequent liquefaction. I certainly think that if there is any condition of the system in which the intra-venous injection of ammonia is warranted, and likely to be of use, it is this.

In the treatment of all the Urticarious, Purpuric, and Anthracoid Blood Diseases, ammonia is of especial value. Often, indeed—notably in Blain in the ox—one or two bold doses at the outset being all that is required for the restoration of health.

My *penchant* for this drug, as a stimulant in the treatment of Parturient Congestive Fever in the cow, is, I imagine, well known to most of you through the medium of the paper which I read before the Scottish Metropolitan Association in 1872.

As I maintained then, so I hold now, that there is no therapeutic agent which we can administer with so much hope of success in the treatment of this disease as ammonia: assisting us, as it does most powerfully, by its solvent effects on the blood, and by its stimulating effects on the glands and upon the respiratory centre. It is, with appropriate adjuvants, admirably calculated to tide our patient over the most critical period (Apnœa and suspension of the organic functions) of the disease; and this, quite independently of any particular view which may be held as to its pathology.

While referring to this disease I may be permitted to protest against the way in which some writers have, as it were, bound me down to one particular view of its causation. When alluding to the influence of the anatomical distribution of the cerebral blood-vessels as a predisposing cause of Parturient Congestive Fever in the cow, I did not thereby imply that this was the actual cause of the affection in this animal, but only a predisposing, and, in one sense, a secondary cause.

So far as we know at present, it is rather due, primarily at least, to some depressant influence exerted on the organic, rather than on the cerebro-spinal system of nerves, and to this view of its nature I gave great prominence in the paper to which I have before referred.

Another idea in connection with its causation has of late occupied a large share of my thoughts, viz., that it is somewhat allied to acute Uræmia in the horse, *i.e.*, due to the accumulation (from a superabundant supply) of nitrogenous and carbonaceous elements or compounds derived from them in the blood. This idea I entertained and expressed in 1872, but it has of late gained a firmer hold upon my mind. In seeking to fathom its

etiology, we should not confound parturient convulsions (from Anæmia of the brain) with parturient cerebral congestion or Apoplexy, and we should further remember that its causes may be diverse and complex.

There is another disease—viz., Acute Uræmia, so called Azoturia—in the horse, in the treatment of which ammonia, as an organic stimulant, is of great service. In Uræmia we have a disease in which oxidation compounds, in the first instance, collect in superabundant quantities in the blood; and in which the glands, the liver, and kidneys, more than any other, are, in the second place, incapable from functional derangement, or rather exhaustion of their cells, of elaborating the various constituents which go to form Uric and Hippuric compounds, or of eliminating them when formed. And surely those agents which will assist and hasten the elaboration and elimination of these compounds, and at the same time strengthen the nervous system —particularly the ganglionic—under the balefully depressing influence to which it is exposed, must be of more real value than the use of depressing agents such as colchicum or nitrate of potash.

Ammonia has been condemned in the treatment of this affection, because it is thought that ammoniacal compounds, or others closely allied to them, already existed in the blood to too great an extent, and that ammonia carbonate, being formed from the decomposition of the urine in the bladder, is re-absorbed into the blood, and produces some of the phenomena which we are accustomed to see in this disease.

Granted that ammonia carbonate may be so formed and so re-absorbed, it is only in very rare cases that it is a primary cause of the malady, though it may be a secondary cause, when the urine is allowed to lie in the bladder for too long a period.

All our knowledge of the nature of Uræmia points at present to the use of agents which will stimulate the liver, the skin, bowels, and kidneys to the more perfect performance of their varied functions, and which will, at the same time, support and stimulate the nerve centres under the depressing influences to which they are exposed.

Ammonia, as an expectorant, may be combined with squills,

ipecachuana, etc., in coughs, especially if there is accompanying depression or dysorexia; or with potassium bromide, or camphor mono-bromide, where the cough is of a violently spasmodic character.

Inhalation of ammonia is of much use in catarrhal affections, in nervous depression, Syncope, Apoplexy; poisoning by prussic acid, chloroform, and allied agents. And it has been asserted by Dr. Gaillard, that it may be used in conjunction with, and to guard against the depressing action of chloroform.

Ammonia ought to be used much more largely than it at present is, by means of *intra-venous injection*. It has been so employed by various therapeutists for different purposes, and with the best results. I have already said that its use in this way is indicated in intra-venous and cardiac clotting. To all I would say, give it a trial, as opportunity offers, in nearly every form of collapse, in blood-poisoning, in poisoning by sedative agents and foul gases; and, above all, in Parturient Apoplexy.

It is easily introduced into the veins, by the aid of the subcutaneous injection syringe, the only precaution necessary being to guard against its passing into the surrounding tissues.

In the ox and sheep, *Gastric injection—i.e.*, passing ammonia solution by the aid of the trocar and canula into the rumen—should be always had recourse to in cases where fluids cannot be administered by the mouth, or there is danger in so doing, and where Dysphagia exists.

STIMULATION.

Now I feel quite prepared to hear some of you say that I have been too laudatory of the virtues of ammonia, in the remarks which I have just made. But I will say still further, while I do not hold it up as a universal panacea, that were I reduced to the choice of employing only one agent in my daily combat with disease, that agent would be ammonia; for there is no drug in the Pharmacopæia so potent for good when judiciously used.

In concluding my subject, I will apply the remarks I have made on ammonia to the stimulative system in the treatment of disease generally.

At different periods, in all ages, the minds of men (alike in

medicine as in other professions) have glided insensibly into two opposite extremes—extremes the very antipodes of each other, and only to be explained by some influence acting *violently* on the mind—such as the abuse of a particular system or one acting *more gradually*; such as the neglect, for a period more or less prolonged, of a particular system or method. We see this exemplified in the marked disuse, and in some instances total abolition of venesection—a remedial measure which, when intelligently applied and assisted, is often of the greatest use. We see it still more exemplified in the disuse of not only internal but external stimulation, and that mainly owing to the way in which the use of venesection and stimulants have been abused.

In practice—especially in large towns, where horses are subjected to severe and prolonged exertions (sometimes by night as well as by day), and not infrequently fed upon materials such as Indian corn, foreign hay, and light oats, which are totally incapable of repairing the waste of nitrogenous elements constantly going on; or, on the contrary, fed upon materials so rich in their nature as to load the system with a superabundance of nutrient elements and to render it impossible for the gland cells to elaborate or the tissues to assimilate it—the axiom laid down by me in my essay on the "Action of Medicines," read at Manchester in 1871, viz., the "Conservation of Vital Force," must ever be acted on if we would do our best for our patients and our clients.

The systems of animals—unlike those, unfortunately, of many men and women—are not saturated, nor their nervous energies blunted, by the habitual use of alcohol; consequently in administering it we are really having recourse to a medicament as much as though we gave arsenic, phosphorus, or any other powerful drug.

The value of the stimulative over the depressant, or over the *do-nothing* system of treatment, was never more forcibly impressed on my mind than it was, many years ago, by a remark which fell from the lips of our late lamented friend Gilbert Heyes. When in consultation with him one day on a severe case of Catarrhal Influenza, he said, "We cannot afford to knock our patients down in town practice: the time of a horse is money

to his owner, and it is our function to keep up his strength, so as to enable him to return to his work as quickly as possible."

Largely as I had employed alcohol and ammonia previously, I gave them to a much greater extent subsequently to the above-quoted conversation; and after many opportunities of watching different systems of treatment since that time, I have not yet seen the truth of the remark disproved, but quite the contrary, though in horse practice it will apply more strongly to the town than the country, as in the latter, animals exist under much more natural conditions.

It is in the abuse of the stimulative system of treatment, or in its application under wrong conditions, that errors arise and that harm is done.

A powerful and prolonged vesicatory or suppurative action will irritate, weaken, and depress, where a sharp stimulant (a flying blister), judiciously repeated, will rouse the nervous energy, give a fillip to the circulation, and stimulate the nutritive functions of a part or organ.

The administration of a large dose of whisky or ammonia just at the critical moment when the balance is suspended between organic derangement or organic disease, or between exhaustion and recuperation, will often turn the scale in our patient's favour.

Instance a case of Pleurisy or pulmonary congestion in its early stage. How often do we see it checked by the application of a sharp stimulant to the sides and legs, and the administration of a few bold doses of ammonia and alcohol; or, as we are sometimes tempted to do—taking a physical view of the condition of the circulation—by administering a bold stimulant, abstracting a moderate quantity of blood, and applying a sharp irritant to the sides.

Instance, again, a case of Pleurisy or Pneumonia which has been hanging on for days, and we are hourly expecting effusion in the one case, death from exhaustion or Asphyxia, or breaking up of the lung tissue, in the other. How often have I seen similar treatment (aye, even the insertion of a seton or rowel in Pleurisy) produce remarkably good, almost magical results.

In the use of stimulants, some practitioners are apt to imagine

that a bold dose at long intervals is all that is required. Herein lies one of the greatest errors connected with this system of treatment.

Take a case of Parturient Collapse in a cow, demanding a strong dose of ammonia and alcohol every twenty or thirty minutes, until reaction sets in, and content yourself with giving one large single dose and leaving your patient to her fate. You will find that you have aroused a temporary and evanescent flickering of vital flame, which will be all the more fatal for the sudden reversion to the condition of depression and exhaustion which existed previously.

The fable of the hermit with his "elixir of life" aptly illustrates this proposition. His first dose roused the dying man and restored warmth to his limbs, the second dose induced a return of consciousness, the third was accidentally spilt on the earth, and the lamp of light went out for want of further sustenance.

Another great mistake which is often made in the use of stimulants, is the sudden withdrawal of them after a patient shows signs of rallying, instead of gradually and judiciously reducing or increasing the interval between the administration of the doses; and still another mistake is perpetrated in not remembering that ammonia is not a food, and that while alcohol reduces the oxidation of the tissues and lowers temperature, it stimulates the digestive functions, and requires, for the due reaping of its beneficial effects, to be combined with food easy of digestion and assimilation.

Lastly, to be of service in debilitating fevers, the use of stimulants should not be delayed too long, especially when there is a tendency to emaciation, exhaustion, congestion, or depression of the heart's action.

In penning the foregoing remarks, particularly, I have had one object in view, viz., to impress upon your minds the great benefit which may be derived from the judicious employment of an agent which is too frequently neglected, or the usefulness of which is too little known and appreciated.

I have never yet seen a single instance in which ammonia carbonate has been brought prominently before the notice of a

practitioner, that it has not become a permanent tenant in his pharmacy, and not only a permanent, but a highly-valued one.

It may be urged by some, that if its action is to render the fluidity of the blood more pronounced, it must be injurious. In answer to such a remark, I have only to say that during its administration it is an easy matter to extract a small quantity of blood from an animal, and test its coagulability by exposure to the atmosphere. And it would have to be given in very large quantities before it would produce any pronouncedly injurious effect upon the blood. The liability of ammonia carbonate to produce intestinal catarrh when given in large doses, may also be urged against it as a therapeutic agent in Influenzas. But in all such cases, in my experience, the intestinal flux has been premonitory to a rapid convalescence.

I have not entered fully into the matter of stimulation, preferring rather to string together a few hints which may form texts for a good and profitable discussion.

SUGGESTIONS ON THE DIAGNOSIS OF GLANDERS AND OZŒNA, FARCY AND PYÆMIA.

BY ROBERT WARD, F.R.C.V.S., LONDON.

THE diagnosis of the above diseases is a subject that should receive grave consideration by members of the profession at the present time, for the recent exhibition of diversity of opinion by veterinary surgeons on this subject has attracted considerable attention, tending to leave impressions of our incompetency to diagnose that terror to the public, Glanders and Farcy.

It will be doubtless fresh in the minds of most of the readers of the Journal, that a short time since, a mare belonging to Mr. Clark, of Islington, which had been sold at a Repository with many others from his stud, had been condemned by one of the Privy Council veterinary inspectors as Glandered; the animal had reached the horse-slaughterer's premises, when the former owner arrived with his veterinary surgeon, Mr. Priestman, who at once declared the animal was not so affected. Prof. Pritchard

was called in, and corroborated the opinion of the latter. The animal was removed, placed under treatment, and soon recovered; and further, we are told by Mr. Clark, is now working.

There is no need to dwell on the importance of this case.

Another case occurred at Bow. A gentleman having one of his horses out of sorts, sent for a member of the profession, who treated the animal for about eighteen days, and then discovering the case to be one of Glanders, informed the owner, and advised its immediate slaughter. The owner sent the animal away for that purpose, but, in his ignorance of the law, omitted to inform the police, he was summoned for moving, etc., and fined £10 and costs. Now the question arises in this case, If the animal was suffering from Glanders on the eighteenth day, how came it that the disease was not diagnosed early—if not on the first day?

Last year I was requested to inspect a stud of horses, and discovered two affected with Farcy, which the veterinary surgeon attending had designated Pyæmia. It so happened the same afternoon that Mr. Fleming paid me a visit. I asked him to accompany me to inspect these patients, and he did so, recognising the cases at once as Farcy. In the evening the Privy Council inspector condemned them as very bad cases. In the course of a few months several others died or were destroyed, suffering from both Glanders and Farcy. To close the sequel, the attendant became affected with Farcy, was placed under most skilful treatment for some months, and, I am glad to say, has recovered and resumed his duties.

The whole of the stabling has been reconstructed, drained and ventilated—all old woodwork, etc., replaced by new, a new stud purchased, and now we have no more "Pyæmia," Glanders or Farcy.

A short time since, my opinion was sought on a case of reported "Ozœna." On close inspection I assured the owner that it was a very bad case of "Ozœna"—*i.e.*, one of Chronic Glanders.

In 1852, I remember, my father purchased a brown mare at the Repository in Little Britain, City. The animal was discovered to be "running at the nose" the next day, and to be "jugged." The attending veterinary surgeon reported it to be

"Ozœna." She was placed under treatment, although I demurred; eventually she showed evidence, "unmistakably," of Glanders, and was destroyed, leaving much annoyance behind her.

In 1854, during my pupilage in Ireland, I remember going a journey to see two horses reported to be suffering from Nasal Gleet. Upon my arrival, I was informed the groom was ill in bed in a room over the stables, with the same "sort of thing," by his poor old father, who was doing the son's work. I examined the patients and found one suffering from Farcy, the other from Glanders. I informed the owner as to my opinion, and rode home to report the result to my employer. Next morning, early, we visited the patients and had them both destroyed and buried. I regret to say the young man died shortly afterwards. The experience of the case in 1852 led me to diagnose these cases.

In August, 1857, I visited a farm in Hertfordshire, to inspect a stud of cart-horses reported to be suffering from "Nasal Gleet." These I found to be affected with Chronic Glanders, and although one or two had died, the real state of affairs was not discovered; and even when I explained the nature of the disease, it was not accepted until the late Mr. Foalkes, of Bishop Stortford, was called in, who at once condemned them.

In 1861-2 I had charge of a large stud of omnibus horses in the north of England, and saw a vast amount of this "Pyæmia" and "Ozœna," and with all my persuasive eloquence I could never convince the manager that it was better known under its real names of Glanders and Farcy. I found the stud thoroughly impregnated with this disease, scores of horses dying from Glanders in its acute form, others with both Glanders and Farcy combined; and yet I never convinced this gentleman as to the nature of the maladies, although a mare he himself worked, and one I also employed became inoculated and had to be destroyed, and even a man or two sickened and died from this direful plague.

It took me nearly two years—at least eighteen months—to stamp out this disease from among these horses; and this, after hard and anxious work, with every assistance from the directors, I had the satisfaction of seeing accomplished.

I have selected these important cases from my note-book, and

entered into these preliminary observations with the view of impressing upon our younger members the necessity for most careful observation, investigation, and the great advantage of an extensive clinical course of study; for errors in diagnosis of these direful maladies may blight their professional career at its very commencement.

In my next paper I will offer such notes and remarks on the above diseases as may occur to me, and which I may think of interest; and although, perhaps, I may not be able to furnish anything new, nevertheless I trust it may prove an incentive to thought and study on the part of the juniors, and stimulate the older practitioners, who may be better able, but not more willing than myself, to pen valuable suggestions and advice of paramount importance to the new men, being the result of research in the broad and proper field of actual practice.

THE PRINCIPAL FACTS HITHERTO ASCERTAINED CONCERNING BACTERIA.

BY J. H. STEEL, M.R.C.V.S., ROYAL VETERINARY COLLEGE.

(*Continued from page* 174.)

THE *Ascococcus* of Bilroth, *Cohn* considers as of two distinct forms. One of these he terms *A. Billrothii.* It is an extremely small spherical Bacterium; numbers become united together to form lobed masses, surrounded by a gelatinous or even cartilaginous envelope. They increase and form a creamy scum, with an odour like lactic acid and ether. It may be obtained from water containing decomposing muscle, or hydrocele fluid; is grey or greenish grey, knobbed or cylindrical. The scum which it forms is five mm. in thickness, and finally sinks. It results from the palmelloid form (Billroth). If embedded in *Coccoglia,* ascococcus forms spheres or cylinders of micrococci united into colonies, and tied together by a remarkably fine *glia.** No membrane can be observed around this: several large cells form, by transverse division, long cylindrical spiral tubes, in which appear chains of cocci by longitudinal division and branching; these

* Cohn's *Beitrage Zur Biologie des Pflauzen.*

repeated branchings produce very small (micro) cocci. When this has gone on for some time, micrococci escape by bursting of one side, and the envelope which is left is seen to have a double contour, and is easily recognizable by its greenish-brown colour.*

Two forms which have been carefully investigated by able workers will now be somewhat at length treated of, as from examination of these important deductions have been drawn.

Bacterium lactis (Lister).† Nearly all forms of Bacteria will thrive in milk, but there is one which occurs only in connection with unsterilized milk, and is especially prevalent in dairies. Thus, though boiled milk will putrefy, it will not undergo those changes which constitute lactic fermentation. It must receive the germ, *B. lactis*, from without, or this change will not occur. This organism is motionless, and $\frac{1}{20000}$ of an inch in length. It occurs mostly in pairs or groups of three or four, and cannot develop in Pasteur's solution, and is dwarfed in urine. The sour odour of fermenting milk probably depends upon an ether given off. Since this Bacterium is always present when lactic fermentation occurs, and v.v., it is considered the cause of this phenomenon. In the course of his investigations of the organisms which occur in milk, Lister has observed a hyphomycetous fungus, which he has named *Dematium fuscisporum*. You will see this in the accompanying diagram as copied from his paper, and may observe delineated the three processes of reproduction which Lister attributes to it. The thread-like hyplæ, produced by modification of the spores, he believes he has shown to become Bacteria.‡ He hesitates before applying this theory of origin from fungi to all Bacteria. He has cultivated the Bacterium which thus arises, and finds that in various media of growth it undergoes changes in size and motility, while he mentions *branching*, a property denied by all other observers to Bacteria. In the case of another milk Bacterium, which gives rise to viscosity, he remarks the peculiar differences in appear-

* Billroth. *Von Coccobacteria septica.*

† See *Transactions of the Pathological Society*, 1878; also *Medical Examiner*, 1878, p. 14.

‡ *Quart. Jnl. Mic. Sc.* New Series, vol. xiii., p. 380, *et seq.*

ance between the ends and the middle portion of the plastids; he has noted, too, its Zooglea stage. His observations seem to indicate transitions between the Leptothrix and Spirillum phases of another milk Bacterium, and he mentions a remarkable pigment-producing property manifested by *B. lactis* when placed under certain experimental conditions. But there are true chromogenous Bacteria, one of the most remarkable of which is *Micrococcus æruginosum*, which gives to pus that bluish colour which it sometimes presents. Sanderson tells us that some coloured Bacteria are highly virulent, and we are told of miraculous cases of appearance of blood on bread, which is really due to the rapid development of a maroon-coloured Bacterium. Bacteria may appropriate colour from without, may manufacture colour and throw it off, or may manufacture it for their own use. A form exhibiting the latter property is *Bacterium rubescens*, named, figured, and investigated by *Professor E. Ray Lankester.** He considers Bacterio-purpurin a colouring matter distinctive of this form-species, by which it can be recognized. By carefully observing the presence of this he has determined that this species may assume sphærous, bacterioid, filamentous, and acicular forms. And the individual plastids (cells) may become aggregated in linear, stellate, globose, massive, arborescent, reticular, and tesselate modes. Around these aggregations and free plastids he almost invariably finds gelatinous matter which may bind them together, constituting the "Zooglea State." Sometimes, however, the plastids are naked. He determines that in the transparent portion of the Bacterium, circumscribed masses of coloured matter may be present, constituting the loculated condition; and shows us that a filamentous transparent (acicular) organism, with many loculi close together, really is a "Leptothrix," but the transparent matter is not dead, for it exhibits movements apparently of a spontaneous nature. Dr. Klein observed a red spirillum, which Lankester considers simply a phase of *B. rubescens.* In his last observations on the subject, he notes the occurrence of large discoidal forms (macroplasts), which attain a diameter of as much as $\frac{1}{150}$

* *Quart. Jnl. Mic. Sc.* New Series. Vol. xiii., p. 409, 1873, and vol. xvi., p. 27, 1876.

in., presenting a marked contrast to the minute termo-like forms $\frac{1}{20000}$ in. long, which occurred in a macerating tub. The acicular, leptothrix, and bacterioid forms exhibited movements: slow in the leptothrix, active and darting in the other forms. Also a mycoderma or pellicle form was determined, though Cohn had described it as a distinct organism under the term *Clathrocystis rubeo-persicus*. A remarkable tesselated form of aggregation of the plastids of extreme regularity recalls the general appearance of *Sarcina ventriculi* (Goodsir). *Ophidomonas sanguinea*, (Ehrenberg), described by Klein, is probably a ciliated monad form-phase of *B. rubescens*. The cilium has not been observed, but agitation of the fluid behind by it has been noted.*

This species occurs in a decomposing solution of animal and vegetable matter, such as lichens and infusoria. Light seems to favour its development, but not to be essential. It throve in distilled water. Its colour varied considerably, but in all cases was due to the Bacterio-purpurin. Phyllocyanin is absent.

By some botanists these coloured organisms are classified under the division "Chroococcaceæ" of the Algæ; but Lankester considers them Bacteria, since they take the biscuit-shaped form, exhibit motile stages, and contain no chlorophyll; also the vegetative processes of growth in the two (*B. rubescens* and *B. termo*) are similar. True Chroococcaceæ, too, never assume the filamentous form, in consequence of union of their cells in a linear manner.†

It must be noted, too, that by some the term Bacterium is considered to include the several form-phases of the single species, whereas others speak of the single rod-like phase as the Bacterial. This difference tends somewhat to confusion. Throughout this paper it will be observed we speak of all forms as Bacteria.

We must next examine the position which Bacteria must occupy among living organisms, from a biological point of view. When they were first discovered, these rod-like bodies were thought simply to be complex crystals of organic compounds;

* *Quart. Jnl. Mic. Sc.*, October, 1875.
† Sach's *Text Book of Botany* (Eng. trans.), p. 214.

but few will now hold this view, though Dr. Hartz, of Munich, in 1877, considered them inorganic.*

They appear, grow, develop, reproduce, and die, and, in fact, manifest *all* the signs of vitality. It being therefore allowed that they are organic, we have to inquire to which kingdom they belong—whether the animal or the vegetable. Ten years ago they were unanimously considered Infusorians by all who admitted their organic nature, the opinion being based upon their apparently voluntary motion, their general appearance, and the presence of flagella or whiplike processes of locomotion. Soon it was determined that they are totally devoid of mouth and certain differentiations of structure, such as belong to Infusoria; they were then degraded to the monads—Rhizopodous protozoa, which consist of structureless protoplasm, have foot-like temporary processes, and multiply by fission. The analogies here are marked, but not exact; for as Professor Lankester has shown, in no case have true monads *post*-flagella, such as are seen in Bacteria; nor are they flagellate at each extremity as three forms of Bacteria have been shown to be, *i.e.*, *Bodo Spirillum* and *B. termo* (Dallinger and Drysdale).† Spermatozoa are familiar examples of these postflagellate organisms, simply reproductive agents. It is worthy of note here that Spirillum bryozoon has been proved to be the spermatozoon of a moss.‡ *Lister* is an advocate of the theory that Bacteria are not independent forms, but simply reproductive agents. He notes that in infusions they generally appear with certain fungi, and claims to have demonstrated the production of Bacteria by a fungus, *Dematium*. He gives a figure of this, but I am not aware that his views have been confirmed.§ *Hæckel* suggested the "Regnum Protisticum" to include all organisms which cannot be proved to be either animal or vegetable, on account of their extreme simplicity. The higher forms belonging to this kingdom "strike out" either in the animal or vegetable direction in the course of evolution.

* *Veterinary Journal*, i., 1877, p. 118.

† *Quart. Jnl. Micros. Sc.*, 1876, p. 26.

‡ Potash destroys monads, but not Bacteria, which are coloured red by iodine and sulphuric acid, and thus differ markedly from surrounding Infusoria. Griffith and Henphrey's "Micrographic Dictionary."

§ *Quart. Jnl. Mic. Sc.*, 1873, pp. 393-4.

Bacteria have been considered protistic, and probably are so, but exhibit Algoid affinities, and are therefore by most competent observers considered the lowest plants. They resemble the Algæ, in that some are known to generate spores (Chlamydospores), in that they are capable of assuming a stationary form comparable with the "resting" stage of Protococcus, and in that they are capable of living upon inorganic matters alone, as well as upon organic solutions; and, lastly, we must remember that the doubtful evidence of chemical analysis tends to prove their outer layer to be cellulose, and their inner substance protoplasm. Thus by Sach's they are placed among the Algæ in the order *Schizosporeæ* with Nostoc and its allies, which form gelatinous incrustations or masses on damp earth, etc. Bacteria the constitute family *Schizomycetes* (Cohn).

With regard to the classification of Bacteria, the matter is so complex that we shall give the views of the most able observers with care. The researches of Dallinger lead him to the conclusion that "on the whole, examination of the lowest organisms tends to confirm Darwin's views" that species are not distinct products of separate acts of creation, but result from the influence of surrounding conditions in producing modifications of form. Ray Lankester* views Bacteria as "Protean organisms," which, according to the necessary adaptations to surrounding conditions, assume the Leptothrix, Coccus, and other forms. And he is particular in impressing upon us that these modifications are not "alternations of generation," but true Protean strategies whereby destruction is avoided. We have seen that he satisfactorily gives the life-history of *B. rubescens* from this point of view. He allows that probably Bacillus is a distinct genus. He defines Bacteria as "all those Schizomycetes which under ordinary conditions of growth present biscuit-shaped plastids capable of active locomotion."† Billroth considers that the various forms found in putrefying solutions constitute one species, variations in form, etc., depending upon surrounding conditions. Adopting this view he classifies as follows:—

* *Quart. Jnl. Mic. Sc.*, 1876, p. 27.
† *Quart. Jnl. Mic. Sc.* Vol. xiii. New Series.

Coccobacteria septica. { Bacterium (Rod-like) { Micro / Meso / Mega ; Coccus (Round) { Micro / Meso / Mega }

The Leptothrix form the terms *Streptococcus*, and the Zooglea is *Gliacoccus*, each being an aggregation of Cocci. I have roughly copied a few of his excellent and carefully-executed figures as indicating the size of these organisms.* Cohn considers that we must, at least provisionally, regard the various forms as distinct species.† Thus the Schizophytæ comprise

Gloegenæ. Tribe I.	Free cells, or those dividing binarily or quaternarily. Cells insulated into amorphous families of Mucus.
Nematogenæ. Tribe II.	Cell filaments unbranched. Fibres with false branches.

Later he seems to have somewhat modified his classification,‡ but into its complexities we have not time to enter; but we note in Tribe I. Chroococcus, Micrococcus, Bacterium, Clathrocystis, Ascococcus, and Sarcina (Goodsir),§ with which we are now more or less familiar. And in Tribe II. Bacillus, Leptothrix Beggiatoa, Vibrio, Spirillum, Spirochæte, Streptococcus, etc. A classification of Cohn's is into I. Chromogens, or colour producers, as B. rubescens; II. Zymogens or Saprogens, or ferments; and III. Pathogens, or disease producers, including the following noteworthy forms—Micrococcus vaccinæ (Sanderson and Chauveau); M. diphthericus (Eberth); and M. Septicus (Cohn). These are all forms of round or *Sphærobacteria*, including the genus Micrococcus. The next order is *Microbacteria*, comprising Bacterium, including B. termo and B. lineola (B. lactis, vibrio tremulens, etc.).

Order III. comprises *Desmobacteria*, with two genera, Bacillus and Vibrio.

Order IV., *Spirobacteria*—Spirillum and Spirochæte.

The following table is a summary of *Griffith* and *Henfrey's* subdivisions (see "Micrographic Dictionary," 1874):—

* Billroth "Untersuchungen über die Vegetations-forme von Coccobacteria septica." Berlin, 1874.

† Cohn, F. J. "Uber Bacterien die kleinsten ebenden wesenden" in "Sammlung. gewess. Ständlichen wissenschaft Vortrig, etc. Sec. vii. Heft 165, 1866.

‡ *Quart. Jnl. Mic. Sc.* Vol. xvi. New Series. 259.

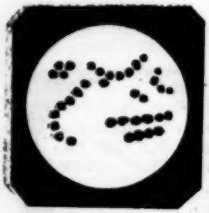
§ "Beitrage zur Biologie der Pflanzen," 3d Heft. 1875.

Infusoria or Algæ.
- Filament straight.
  - Inflexible (1) *Bacterium*, vacillating not undulatory movement.
    - B. termo (Duj.). V. lineola (Ebr.). Colourless, twice as long as broad, slightly swollen in middle, composed of one or two joints; lengths $\frac{1}{5000}$ in. to $\frac{1}{12000}$ in breadth, $\frac{1}{12000}$ in. to $\frac{1}{30000}$.
    - B. Catenula. B. punctatum.
    - B. triloculare (Duj.). B. lineola (Cohn). B. lactis (Lister). Oval, 2-5 times as long as board, 3-6 joints; length, $\frac{1}{2000}$ in. to $\frac{1}{3000}$ in.; breadth $\frac{1}{100000}$ in.
  - Flexible like a Serpent). (2) *Vibrio*, filiform, jointed from imperfect division, movement undulatory.
    - V. Subtilis—length $\frac{1}{450}$ in., breadth $\frac{1}{24000}$ in., with distinctly jointed filaments, straight, motile, not distinctly altering form.
    - V. rugula. V. prolifer.
    - V. Bacillus, length $\frac{1}{222}$ in., breadth $\frac{1}{7000}$ in.
    - V. lineola, v. serpens, v. triloculare.
- Filament Spiral.
  - helical (3) Spirillum (Spirochæte),
  - forming a flat spiral like a watch-spring. (4) Spirodiscus

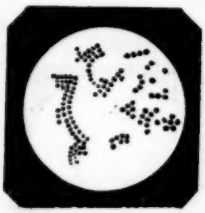
This I give as the only classification by English authors which I have found. We may conclude this rather unsatisfacfactory list of different opinions, by quoting the remarks of Lankester on *B. rubescens*: — "We have in it (and probably also in the true physiological series of colourless Bacteria distributed under such form-genera as Micrococcus, Bacterium, Vibrio, etc.), an example of an organism which is highly susceptible of change of form in response to minute changes of life conditions, and in which such changes have full license, because *form* has very little importance in relation to the essential chemical phenomena which characterize the life of this class of organism and give them specific limits."*

* *Quarterly Journal of Microscop. Science*, 1876, p. 30. With the exception of notices in the professional journals of progress made from time to time at home and abroad in the study of the life history of Bacteria, we can refer the reader only to one source of information in this matter in the works of English veterinary authors: Fleming's "Sanitary Science and Police"—where the Bacillus Anthracis is described, and figured after Böllinger and other Continental observers.

I shall trespass on your time and patience no longer, but trust you will excuse any prolixities into which I may have been led in my hope to thoroughly elucidate my subject. I doubt not that, with me, many of you will be surprised to know how vast is the field which the study of Bacteria opens, and will consider its practical bearings sufficient excuse for the introduction of this paper to your notice.

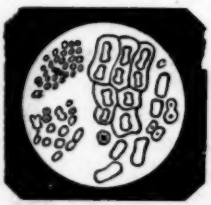


I. Micrococcus ureæ (after Cohn), X 650. Rosary-chain, Torula form; Leptothrix form. Streptococcus (Billroth).

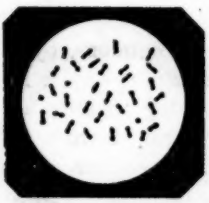


II. Micrococcus vaccinæ (after Cohn), X 650.

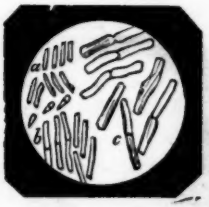
III. Micrococcus; Zooglea form (after Cohn), X 650.



IV. Micro- Meso- and Megacocci (after Billroth), X 1185.
(*a*) *Micrococci* from decomposing blood.
(*b*) *Mesococci* from souring milk and decomposing muscle. (The lobed cell just above the letter is one of Billroth's "dauersporen.")
(*c*) *Megacocci.* (To the left of the letter is one of those cell aggregates of Sarcina form, which parallel the "tesselated" phase of B. rubescens, as shown by Ray Lankester.)



V. Bacterium termo, free motile form (after Cohn), X 650.



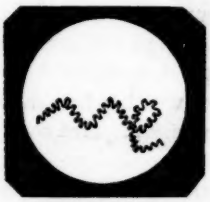
VI. Micro- Meso- and Megabacteria (after Billroth), X 1185. Between the *Microbacteria* (*a*) and the Mesobacteria (*b*) are some coccus-like forms, with a wedge-shaped tail appended to each; these remind us of the "dauersporen" with caudato appendage figured by Gutmann in his paper on Septicæmia. (*c*) Megabacteria.—Billroth figures also some of these containing meso- and megabacteria.

VII. Bacterium lineola, free motile form (after Cohn), X 650.

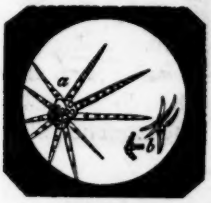
VIII. Bacterium lactis, grown in turnip infusion or sour milk (after Lister), X 1050.

IX. Bacterium lactis (after Lister), X about 1050.
(*a*) Motionless forms from Pasteur's solution, the Bacteria having passed through urine.
(*b*) Active phase of the same.
(*c*) Bacteria found in milk.

X. (*a*) Spirillum undula.
(*b*) Spirillum volutans.
(*c*) Spirillum tenue.
(after Cohn), X 650.

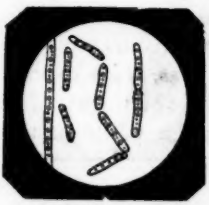


XI. Spirochæte plicatilis (after Cohn), X 650.



XII. Stellate aggregations of Bacteria forms.
(*a*) "Globigerina-like" form of B. rubescens, X about 1500 (after Ray Lankester).
(*b*) Forms of "Coccobacteria septica"—*v.* B. termo (after Billroth), X 1185.

XIII. Bacillus subtilis (after Cohn), X 650.



XIV. Bacillus ulua (after Cohn), X 650.

XV. Dematium fuscisporum (after Lister).
(*a*) Cells of various forms with hyphæ-like out-growths. The lower figure resembles a linear aggregation of true Bacteria appended to the cell.
(*b*) A Leptothrix filament growing out from the hypha, according to Lister; according to other authorities, temporarily attached to, and perhaps parasitic upon, two hypha, X about 500.

A SUPPOSED CASE OF POISONING.

BY "VIRTUTE ET LABORE."

IT is not an uncommon occurrence, during the course of a veterinary practitioner's daily duties, for him to be consulted about the death of an animal, or animals, which has taken place suddenly—or it may be that life has gradually ebbed away—and then it seems to dawn upon the owner that poisoning has been the cause. His mind is often "made up" without any inquiry. However much people may entertain suspicions that "unfair means" have deprived them of their property, yet they do not distinctly say so, but throw out hints of a very unpleasant nature, making servants and others about them feel very uncomfortable; and although themselves conscious of their innocence they do not well know whether their master acquits or suspects them. The following case in point came under my notice, and is only a specimen of many others:—

A certain client owned a valuable brown retriever dog, about four years old and very healthy; so much so, that he had "never had a dose of medicine." About 2nd November, 1877, this dog showed symptoms of ill-health by suddenly having a "violent attack of vomiting and purging." On the 5th a dose of castor oil was administered by order of the owner. The animal continued at intervals to vomit and retch, up to the 20th; but then the retching was more frequent and laborious than at any other time. The creature was much exhausted and very weak; he lay for nearly the whole of the 21st November, and died during the night. During the whole of this period, I am told, he "refused all food, and never had any other medicine except the castor oil." On the 22nd I was asked to proceed to the house and make a *post-mortem* examination of this dog, which was supposed to have been poisoned. Upon arrival I was met by the owner and his brother, who gave me the above particulars, and stated they were very suspicious that some of the servants about the place had administered poison, but who they were they could not be quite sure, though they feared that a certain person—mentioning the name—was very likely the culprit. However, this was a matter I did not wish to investigate, and therefore

desired to see the dog. He was of average size, but very thin and so wasted that he was not much more than a skeleton. The skin and mucous membranes of the eyes and mouth were highly tinged with yellow. The hair on the body was easily removed, which was certainly not to be expected in November, if the dog had been healthy. An incision was made into the abdominal cavity. The flesh was as highly tinged with yellow as the mucous membranes. The stomach and intestines were carefully removed and laid to one side. The liver was enlarged, and comparatively easily broken down. The gall-bladder was nearly empty, but seemed larger than normal. The kidneys were surrounded with very little adipose tissue, but this, with the kidneys, heart, lungs, and thoracic cavity, was deeply tinged with yellow. The stomach was empty, contracted, and yellow in appearance, and its pyloric orifice was inflamed. In the duodenum I found a stone—a sea-pebble—which was irregular in shape, about two inches long by one-and-a-half inches broad, and weighed three ounces. Just where this stone had lain the bowel was swollen and discoloured. The opening of the biliary duct into the duodenum was very much tumified and flattened on its surface, as though something had been pressing against it. There was nothing to show that poison had been administered, the only other contents of the duodenum being about two ounces of a dark-greenish and rather tenacious fluid. In the large intestines the feculent matter was scanty, but very light in colour. The œsophagus presented no appearance requiring comment.

Remarks:—I think this is a case which shows a want of care on the part of the owner. He never tried to save his dog's life, but only gave a dose of castor oil. I understand there was no attempt made to nurse the animal. He had his usual food placed before him—if he took it, well and good; if not, he was "not pampered." No medical advice was sought. It seems that the dog was fond of running after pebbles when they were thrown into the sea by any one, and it is very likely that two had been thrown immediately after each other, and the dog, wishing to retain both, accidentally swallowed one. I surmise that the first attack of vomiting would occur shortly after swallowing the stone, and those occurring subsequently would be due to the

continued irritation this foreign body had set up in the attempt to force it through the pyloric opening. It is very possible that the flattened side of the stone took up its position against the opening of the biliary duct, thus giving the margin of this part a flattened appearance, as well as preventing the flow of bile into the duodenum, and in this way dilating the gall-bladder and also producing an absorption of bile which fully accounts for the general yellow tinge which pervaded the whole of the body. It may be asked whether the greenish-looking fluid in the duodenum had made its appearance there previous to or after death? I am inclined to think previous to death, because of the appearance of the intestine in contact with the stone. The last and most violent attack of vomition, which occurred the day before death, and continued nearly the whole of that day, might be due to the increased flow into the duodenum after the removal of the stone from the orifice of the biliary duct.

I may conclude by saying that the appearance of the pebble, which was shown to the owner without delay, freed every one from suspicion of poisoning, and the news of this "find" soon spread among those immediately interested, giving great satisfaction. This case is a very valuable testimony in favour of autopsies, and if it is deemed worthy of a place in the valuable Journal, it will give me pleasure to tender it as a contribution.

CASE OF DISEASED URETER (?) IN A HORSE.

BY L. BUTTERS, M.R.C.V.S., NORWICH.

THE subject of the above-mentioned condition was a chestnut cart-gelding, about nine years old, which had been at work upon a farm in this district up to the time of his being taken ill. I was first called to him on the 28th May last, the messenger saying, "He could not get rid of his water, and would I either send a drink, or go and see him?" On arriving at the farm, I found the animal standing still in a yard, showing no sign of pain; pulse seventy-two, breathing natural. I suspected he had been suffering from abdominal pain, and made an examination *per rectum*, which contained a small quantity of hard fæces covered with mucus, the lining membrane being dry. I con-

cluded that his bowels were in a constipated state, and administered some anodyne medicine, and also a purgative and injections. On the following day he appeared to be better; his attendants had seen him micturate, and he had fed pretty well. The medicine was also beginning to act, and thinking there was no occasion for my seeing him again, I left instructions that if he did not go on all right I was to be informed at once. On the following day it was reported that the animal had been very uneasy, and was much worse. I found him looking very dull, and he had evidently been in a great deal of pain, as there were several abrasions on different parts of the body. Pulse seventy-two, and he had a very anxious look. His bowels had responded to the medicine. He went on in this way for more than a fortnight, being every now and again attacked with severe abdominal pain and again suffering from constipation. Sometimes the fæces had a tinge of blood mixed with the mucus which covered them.

I thought there was probably inflammation of the mucous membrane, or some diseased state of the intestines of an obscure nature. The animal lost flesh rapidly; he would not eat, and had to be supported with ale, etc. Matters went on like this until the 14th June, when I was again sent for. He was then rolling about; pulse 100, weak and indistinct; eyes sunken; and he was evidently in a dying state. On making an examination *per rectum*, a large swelling was found at a considerable distance within, but above the gut, and at the right side of it; this was very tense, and it was difficult to say whether it contained pus or not, except by its unexpected appearance, as the intestine had been explored on every occasion without there being any sign of it until now. I resolved to operate upon the tumour, and had him with some difficulty removed to the infirmary. I made an opening at the right side of the anus, and extended the incision inward along the wall of the gut, and through the pelvic fascia. I then worked through with the hand until the enlargement was reached; this was punctured with a good-sized trocar, but without anything passing through the canula. An incision was then made upon it, and this gave exit to a large quantity of pus which had a very offensive smell. Some difficulty was experienced during the operation through cutting the internal

pudic artery, which bled very much, but which was stopped by a ligature being put upon it. The distance of the abscess from the external opening was about twenty-eight inches. The wound and abscess were well cleaned out with a syringe and carbolic acid lotion, and a pledget of tow was introduced. The wound went on very well, and the animal began to feed and improve, when one morning the attendant informed me, "He had seen him stale, and the water came through the wound as well as through the penis." Sure enough this was the case, and every morning I found the wound contained a quantity of urine, which ran out when the horse moved. I showed the animal to the members of the Norfolk and Eastern Counties Veterinary Medical Association, at the meeting on the 3rd July last, and also to three or four medical gentlemen who were present. Up to this time I was not aware of the true seat of the abscess, when, acting upon a suggestion of one of the members—viz., to keep a catheter in the penis by a suture through the sheath—I found it emptied the bladder, but the urine came through the wound (which by this time was a mere narrow tube) in a continuous stream; showing that its origin was directly from the kidney, and that it flowed as fast as it was secreted by that organ, while none came through the catheter after the bladder was emptied, the urine in the latter being thicker and oily in character, while that from the wound was like water. The animal began to feed well, regained flesh, and almost recovered his former condition. There was no recurrence of the pain after the operation was performed, but nearly the whole time there were petechial patches on the Schneiderian membrane, and sometimes blood issued from the nostril. Iron was administered, combined with vegetable tonics, and a day or two after he left the infirmary the symptoms disappeared. I saw his owner on the 5th inst., when he informed me the horse was doing very well. There was a very minute opening, and the quantity of urine which passed through it was extremely small. Whether it will cease altogether or not, remains for time to show. In my opinion, there is a diseased condition of the ureter, and the artificial opening is the only outlet for the urine secreted by the kidney on the right side.

CASE OF ANGIOMATA IN A FILLY.

BY W. MARSHALL, M.R.C.V.S., GLANTON, NORTHUMBERLAND.

DURING the last few months I have, in my veterinary practice, met with some very interesting cases, and I believe of very rare occurrence, as they have not been adverted to by our most popular veterinary writers. I will therefore, with permission, relate one of Angiomata on the vagina of a two-year-old filly. About five months ago, A. Moffat, Esq., of Beanley, near Alnwick, drew my attention to a purple protuberance within the vagina of the filly, but at this time it could only be seen during micturition, or when in the recumbent position. On the 2nd of August the owner resolved to have the enlargement removed, as it could then at all times be seen outside the vulva. I forthwith cast the animal, and found two soft boggy tumours, one near the outside of the vagina, and the other about three inches further in. After making a small incision into the one most accessible, out gushed about four ounces of perfectly liquid, dark-coloured blood, which rapidly coagulated upon the ground. The flow being continuous, I compressed the incision with my fingers until I gained time to "chew the cud of reflection." I at last concluded that they were only venous vascular tumours, from the fact that there was no pulsation to be felt, and also from the colour of the blood. I now cut away the whole of the envelope, which was of an irregular fibrous texture, and after causing a copious stream of cold water to be applied to the bleeding vessels, I inserted a few uninterrupted sutures over the lesion, so that they might act as a compress to the now open and exposed inosculating veins or capillaries. I operated on the other sac in the same way, but in consequence of its being deeper in the vagina, I experienced more difficulty. The parts very soon regained their normal condition, and recovery was complete in a short time.

ON THE UTILIZATION OF HORSES WHICH HAVE UNDERGONE PLANTAR NEUROTOMY.

BY W. PALLIN, M.R.C.V.S., 20TH HUSSARS, MANCHESTER.

I READ with much pleasure the interesting article on the above subject in last month's Journal, as it is one which I have had under consideration for some time, and had often thought of bringing it more especially before the members of the Army Veterinary Department, to whom I think it is of much importance. But it is particularly gratifying when taken up by so senior an officer as Mr. Fleming, and treated by such able hands; for it is an operation which, when properly applied and carefully performed, I feel certain will not only benefit the army, but often save from many a hard day between the shafts of a hansom cab, a trooper which would do good service in the ranks.

There is seldom an annual casting of any of our cavalry regiments that one does not find the term "Incurably lame from Navicular Disease" opposite a number of horses, and not unfrequently some of the best. Like many other terms in our nomenclature, this is a convenient one for foot-lameness, as well as being one which, from its length and scientific sounding, at once shakes off all further inquiries from the Inspecting General or commanding officer. Year after year I have seen many of our young troopers sent to the hammer and sold for a song, no doubt lame from Navicular Disease; but my hand has often itched to operate on them, as I believe four out of every five, if carefully unnerved, would give an average of three or four years' more work in the ranks, and often sell quite as well, if not better, when afterwards cast. But, as Mr. Fleming says, the idea that they would be unsafe to ride, or that at the first parade they attended their hoofs would come off, seems to have haunted the minds of most commanding officers, and I consequently felt it unwise to suggest the operation as a means of rendering the animal workably sound. Indeed, for a long time I had the idea that a horse once unnerved would be most unsafe in his action, but more especially over fences or rough ground. An incident which changed my opinion considerably on that point I must

allude to, and my experience since has not changed it very much. It is useless to assert that a horse unnerved is as safe as one with the free enjoyment of sensation; still, after a time the defects in progression are much less than most people imagine.

Some years ago, and before entering the army, I operated on a valuable hunter, the property of a gentleman in Kildare, the animal having shown unmistakable symptoms of Navicular Disease for some months previously, and which had been unsuccessfully combated by the milder forms of treatment for the disease, without any benefit. Although the horse went sound, the owner feared to ride him and sent him to be sold in Dublin, where he was disposed of for a small price, and I then lost sight of him. The following Punchestown Races, to my surprise, amongst a group of horses walking round the paddock previous to saddling for an important race, I recognised my old patient, bandaged, clothed and trained, ready to take part in the cross-country contest, and surrounded by a host of admirers willing to back him at any price. Having satisfied myself that it was no other than the same animal, my first impulse was at once to find out the jockey who was to ride him, and warn him of his danger by telling him his mount was devoid of feeling in both fore-feet; but the saddling bell had already rung, and in a few moments more he jockey emerged from the weighing-room, and the next view of the horse was his tearing up the course in the preliminary, and "pulling double." I was sorry for the jockey if he felt as I did at that moment, for if he did I fear he and the horse would have parted company at the first fence, as I was certain there would be a smash before the end of the long and difficult three miles of the Kildare Hunt-Cup course. It was not until I saw him again in the front rank, passing the stand in the first round, that I breathed freely, and even then I felt very guilty, and had he come to grief badly, I don't think I should ever have operated on another horse, except in such a way as would have left unmistakable traces after it. The "old horse wins," screamed a thousand voices, as the competitors safely cleared the last bank (now taken away for a gorse fence) the last time round, and from that moment the operation went up in my estimation a hundredfold, and I almost lost all interest in the finish (and it was a close one, with my

patient a good third), resolving I would operate for the future on every animal, young and old, which showed symptoms of Navicular Disease. Neither owner or jockey knew the horse had been operated upon, and he was soon after, on the strength of his performance, sold for a good price to come to England. It is idle to think that all cases are as successful as this was, as experience soon told me; but, like Mr. Fleming, I consider that in careful hands the advantages well outweigh the disadvantages of the operation, and I have selected this instance merely as a practical example. A more recent one has occurred. Towards the end of last year, a particularly good young troop-horse in my regiment became lame, and was treated for Navicular-thritis, with blistering, rest, etc., etc., but without any benefit; at the same time he became low in condition and wasted, from evident pain and want of work. So hopeless a case was it, and being so long to keep the horse until the annual casting, that I almost decided calling a Board with a view to have him destroyed. I suggested the operation to my commanding officer, who is thoroughly practical and fully alive to getting a full measure of work out of his horses, and hinted that probably he would not eat so much idle forage till the casting. In a fortnight after the operation the horse went to his troop, *and has never missed a parade or field-day since*, while he has recovered condition and is going sound. Further, the officer commanding the troop to which he belongs would not hear of my including him in this year's returns of cast horses. I am watching his feet carefully, and I think they have grown a little and expanded, and are looking healthy.

I feel sure Mr. Fleming will permit me to add a few words of finish to his excellent and practical description of the operation—namely, the antiseptic course of treatment, which I have found most successful. The operation is often followed by a troublesome, unhealthy wound, which I have always found most difficult and slow to heal, and sometimes leaving a considerable permanent blemish after it. With this treatment such a thing is avoided, and the great advantage of healing by "first intention" and without suppuration is gained. It consists in operating entirely dry, and avoiding all contact with moisture. My plan is to put

a soft dry towel under the leg to be operated on (which should also be quite dry); then, as the blood comes from the incisions during the operation, it is gently removed with the towel, instead of a wet sponge, as is generally done. After the nerve is divided, the hair at the edges of the wound is to be removed and the parts carefully brought together with a silk suture steeped in carbolised oil, over which is placed a pad of lint soaked in the same liquid, and over all a good, long, dry linen bandage enveloping the whole leg. The horse is kept tied up, and the bandage or dressing not removed for at least four or five days, when the wounds will generally be found healed, and no suppuration or unhealthy granulation to be seen. If they should not be quite healed, replace the dressings and bandages for a few days more.

FIBROUS TUMOUR ON THE RIB OF A DOG; ASCITES AND DEATH.

BY H. DARLEY, M.R.C.V.S., WINDSOR.

I HAVE forwarded to the Brown Institution a tumour removed from a mastiff bitch. Mr. Simpson, M.R.C.V.S., with whom I am assistant, was asked to remove it on July 9th. After an examination, he was of opinion (as the tumour was attached to the ribs) that it would be better not to operate, but to endeavour to reduce it by iodine. He therefore prescribed iodine ʒss, spt. vini rect. ʒii. This was to be rubbed into the tumour daily. On the 15th the animal was not feeding, and on examining her it was discovered that she was suffering from Ascites. Tonics and diuretics were prescribed; but on the 16th she died. On making an autopsy, considerable effusion was found in the abdominal cavity, as well as the tumour now sent. The two detached portions were accidentally removed in cutting through the diaphragm. The tumour was five inches long, four inches wide, and two inches thick.

[Mr. Banham examined the specimen, and reports as follows:— The tumour was situated on the seventh rib (counting forwards from the diaphragm), the rib passing apparently through the centre, the ribs on either side being pushed considerably beyond

their normal position. As will be perceived, the growth was somewhat considerable for a dog, especially as it was quite as large on the outer surface of the rib, as I have described it on the inside. The nature of the growth appeared to be fibrous, with several cysts containing fluid. When the tumour was removed from the ribs, the seventh looked spongy and enlarged, as though it had been fractured at some time, and true ossification had not taken place. Whether or not this was the case, I could not be certain, though maceration in water will probably further elucidate the point.]

THE EFFECTS OF LIGHTNING ON ANIMALS.

BY W. F. ANDERSON, VETERINARY STUDENT (WITH MR. E. STANLEY, M.R.C.V.S., NORWICH).

SEVERAL cattle having been killed by lightning in this neighbourhood, my interest has been excited in the subject, and on searching such veterinary records as were at hand, disappointment at the paucity of information only increased a thirst for knowledge.

As insurance of stock from fire usually includes losses from lightning, the importance of accurate diagnosis at once suggests itself, and this brief article is written with the view of elucidating the subject; and as many of the experienced contributors of the VETERINARY JOURNAL can no doubt add much useful matter upon the point, it is to be hoped they will do so.

The query is, Supposed death by lightning. What are the recognised diagnostic symptoms and reliable *post-mortem* appearances?

The following cases are recorded in the *Veterinarian*:—

(1.) *September*, 1864.—Four valuable colts, racing stock, were killed, a mare completely paralysed, and others suffering from partial paralysis, the lightning having affected their nervous system.

It would be interesting to learn the ultimate result of these injuries.

(2.) *July*, 1865.—A farmer's son, and one hundred and fifty-two (152) sheep were killed in Luxemburg by lightning. The sheep were covered with blood, and showed the most extraordinary effects of the lightning. The

heads of some were pierced through and through, while the heads of others were removed from their bodies.

(3.) *November*, 1868.—Out of a flock of five hundred and fifty-four (554) seventy-seven (77) were found dead (after a severe storm, during which the lightning had struck the cliff near the sheep-fold), and two more were in a state of stupor.

(4.) *November*, 1871.—Simply records the instantaneous death of an elephant at the *Jardin des Plantes*, Paris, from the electric fluid.

On the 3rd of August, 1879, a violent thunderstorm, with heavy rain, passed over not only this neighbourhood, but England generally. Between one and three a.m. it reached its height, and at seven a.m. Lord Warwick's shepherd found eleven dead bullocks, of an average value of £22 per head, under an elm-tree in the Park, placed as though their legs had suddenly given way, propped on brisket and belly, lying easily one against another; some on the outer circle had rolled on to their side.

They were all distended with gas, which was bubbling from the nostrils and anus of some; fæces had passed involuntarily; decomposition was rapidly setting in; the pupils were dilated, and *rigor mortis* was complete.

Not one seemed to have struggled in the slightest, as no grass was disturbed, and the horns, feet, mouths and skins were perfectly clean; so that death must have been instantaneous and painless.

The whole of their skins were intact; only on one, by very careful inspection indeed, could slight traces of singeing of the muzzle, face and shoulders be detected; several of them were white beasts, so that such burns could not have been overlooked. All of them were skinned within twelve hours after death, and except two, whose forehead and stifle presented a bruised appearance—most likely caused by their sudden fall—there was nothing to show they had been struck. Indeed, the butcher said that had they been stuck immediately they had fallen, they would have died as "bright as silver."

The blood had settled somewhat in the inferior parts of the body, so that coagulation had taken place gradually.

Their carcases were buried, and the fat with bits of muscle having been hurriedly collected, presented a much darker ap-

pearance than usual, probably from the absence of venesection; but when melted down the fat appeared to be as good as usual.

Expecting to find startling evidence of the ravages of the lightning, the ocular demonstration was at least disappointing.

The tree, a high elm—by no means a solitary specimen in this thickly-wooded park—was only scored in two places down the trunk, on almost opposite sides, in an irregular zig-zag manner, about an inch wide, and several feet long, but no deeper than the bark, shreds of which were scattered several feet from the base of the tree. No other damage was done to it or to the ground in the park.

Although one hundred and sixty (160) head of cattle, and two hundred and fifty (250) sheep were distributed through this park, not one presented the symptoms of being in the slightest degree affected: the inference being that the fated eleven were isolated under this particular tree.

On the same day as that on which the cattle were killed, only ten miles away a horse was struck in the open field. The breast along the off-side and the flank and both the hind legs were scorched and blistered; the skin was not broken. He died without a struggle. One of his shoes—which were not loosened or moved from his feet—was struck by the lightning, and had a black mark about two inches long, but was not rendered at all magnetic. There was a hole, with scorched margin, in the earth where the electric fluid had disappeared, close to the horse.

Our standard veterinary works seem to omit this subject: at least, so it appears in a hasty glance through them.

In the *Veterinarian* for November, 1869, are described the physiological effects of lightning. The following extracts bear somewhat on the present inquiry:—Muscular rigidity; coagulation of the blood; decomposition; marks of various kinds, burns; ecchymosis, loss of hair.

On reference to Taylor's "Medical Jurisprudence," many interesting details are given of the effects of lightning on the human being, and the cases offer points of similarity with those recorded above.

CASE OF LOODIANA FEVER AT A HIGH ALTITUDE.

BY J. A. NUNN, M.R.C.V.S., ROYAL ARTILLERY, PUNJAB.

I SEND the following account of a case of Loodiana Fever which, from its taking place under somewhat peculiar circumstances, may perhaps be of some interest. On the morning of the 17th of June I was requested by an officer of the 17th regiment to look at a bay, five-year-old, entire pony, which he said was dangerously ill; but on my arrival, in about ten minutes, the animal was dead. On inquiry, I was told that he was taken ill on the evening of the 15th June, with a difficulty in swallowing and a slight swelling in the region of the parotid glands. The next morning, the 16th, he was seen by the farrier-major of the 10th Hussars, who applied mustard to the throat and along the course of the trachea. In the evening he was much worse, and evinced symptoms of colic. He died on the morning of the 17th, at about 7.30 a.m. I was unable to procure a thermometer until nearly four hours after death, when the temperature, taken *per rectum*, was 99° Fahrenheit. On removing the skin from around the neck and throat, the usual yellow, jelly-like infiltrations were seen, and a quantity of serum escaped; the trachea was inflamed and covered with petechiæ on its inner surface. On opening the abdomen a quantity of amber-coloured liquid flowed therefrom, and also from the pericardial sac; the bowels and peritoneum showed patches of congestion and petechiæ—in fact, the case exhibited the usual *post-mortem* appearances of Loodiana Fever. The peculiarity of the case seems to be in its occurring at so very high an elevation—this station, Murree, being over 7,000 feet above the sea. The pony was brought from Rawul Pindi, and had been up in the hills about a month. He was in good condition, and had been regularly ridden by the owner. The stable was well ventilated, but the floor was of earth, and did not appear to have been renewed for a long time, being infiltrated with drainage, and very foul. The weather was fine, and rain had fallen a week previous to the attack. An outbreak of Loodiana Fever occurred in the 10th Hussars and Royal Artillery at Rawul Pindi during the summer and autumn of 1878, of which an account was given in the VETERINARY

JOURNAL, but I am not aware of any cases having been observed during the present year. On looking over the records of the disease that I have at hand, I cannot find any mention made of the malady occurring at such a high elevation. I had not a microscope with me, so was unable to examine the blood, which was very dark and tarry.

Editorial.

THE INSPECTION OF MEAT AND SLAUGHTER-HOUSES.

IT is somewhat remarkable that the discovery of trichinæ in American pigs and pork imported into this country—for we may be allowed to suppose that the most obtuse and ignorant person in England does not now maintain that the question of United States pigs being infected with these dangerous worms has still to be determined—has not led to the adoption of measures for securing the public against the dangers of diseased meat. It is quite true that few countries in Europe are more behind the age in this department of Sanitary Science than our own, and that even when danger is pointed out and its extent made manifest, no initiative can be taken, nothing can be done, until months, perhaps years have elapsed, and incalculable damage been incurred. This has been the history of Medical and Veterinary Sanitary Science in Britain, and we fear it will be so to the end, unless more enlightened views are allowed to prevail in high places. This lamentable absence of forethought or of care for the public health, was well exemplified when the muscle-worm was found infesting pigs and pork sent to us from America. On that occasion the public were recommended by the Government to cook the meat thoroughly. The advice was stale and trite enough, and if it could be always carried out would relieve governments of a good deal of what one of them at least appears to consider unnecessary trouble. But thorough cooking cannot be ensured in every instance, and the proffered cheap advice of a non-paternal Government occasioned some merriment among those who understand such subjects.

There is no use in concealing the fact that the public health is greatly exposed to injury by the Government neglect of meat inspection. There are febrile and constitutional maladies of animals which are not only unrecognised by the Veterinary Department of the Privy Council—destructive though they are—but which render the flesh of the animals positively poisonous to those who have the misfortune to consume it as food. Then there are the parasites found in flesh, as the muscle-worm, measle, etc., which, so far as we are aware, though doubtless greatly abounding, yet find no place in the Government sanitary nomenclature. Of the extent to which Trichinosis prevails in animals, or even people, in this country we are in complete ignorance, as no steps are taken to ascertain this point; and it is the same with other parasitic infections.

The carcases of animals which have died from, or been killed in consequence of virulent disorders, or which teem with worms that may occasion the most serious disturbance in those who may chance to ingest them in improperly cooked joints, can be, and are exposed with absolute impunity in meat market and on butcher's stall. Not only this, but animals which may have been under medical treatment and drugged with the most poisonous substances previous to death, have their carcases dressed and offered for sale as food without let or hindrance. True, now and again at distant intervals a seizure of diseased meat—never that infested with parasites—is reported; but this is a mere accident, and the number of such seizures bears no proportion whatever to the extent of the traffic; and it is far more frequently meat which has been badly dressed or is in a state of decomposition, not that from an animal which has been suffering from disease. The majority of those who play the part of inspectors know little, if anything, of the disorders which render flesh dangerous, nor yet of the appearances which should lead to its detection when it is offered for sale. Certainly, there is no evidence that they are at all acquainted with these parasitic conditions of meat which are quite as objectionable as disease; for we never remember hearing of an instance in which these functionaries rightly condemned flesh because of its being worm-infested. That parasitic flesh is not a scarce commodity there is no reason to doubt; and only the other day, in the main thoroughfare of a royal borough, at the door of a butcher's shop we saw portions of the carcase of a pig containing a plentiful supply of the characteristic bladder-worms, the larval form of the human tape-worm *Tænia solium*.

The remedy for this discreditable and dangerous state of affairs is obvious, though we fear we shall have to wait many years before it is adopted, as human and animal health is not yet sufficiently valued among us to receive that attention which would lead to its protection from disgusting and oftentimes fatal disorders. The fact is, that in the matter of meat inspection we, as in many other affairs, commence at the wrong end. Inspection should begin at the slaughter-houses, and the first step to be taken in this direction is the suppression of those abominable dens of filth, cruelty, and diseased flesh—the private slaughter-houses, and the substitution of public abbatoirs. No animals—cattle, sheep, pigs or goats—except by special permission, should be killed for food beyond the precincts of the abbatoirs, and every animal and every carcase therein should be inspected by a well-trained Veterinarian. Only in this way can the public be certain that dangerous flesh is not offered for sale. The increasing prevalency of Trichinosis urgently demands that the flesh of the pig—the animal which is most to be dreaded in this respect—should be submitted to a microscopical examination before it is allowed to be sold as food—a precaution which is adopted in other countries. We learn, for instance, that the police authorities of Berlin have issued an order relative to the compulsory inspection of meat within the city district. The first paragraph provides that any one killing a swine, or causing it to be killed, must have the flesh microscopically examined by the official inspector of meat appointed to the district in which the

animal is slaughtered. Only on the production of a certificate from this functionary that such examination has been made, and that no trichinæ have been found in any part of the body inspected, may the carcase be dressed and the meat exposed for sale. The second paragraph provides for the division of the district into sub-districts, and the appointment to each of them of one or more inspectors. The new measure comes into force on the 1st of the present month.

Not only should the abbatoirs be under Veterinary supervision, but thoroughly competent Veterinary Surgeons ought to inspect butchers' stalls and other places where meat is sold, in order to detect evasions of the law, and pronounce as to the healthiness or otherwise of their contents. Until these measures are adopted and rigidly enforced, the present extensive traffic in meat unfit for human food will continue and increase, greatly to the detriment of the public health and well-being.

THE WAR IN AFGHANISTAN.

THE resumption of hostilities in Afghanistan again draws attention to the recent enormous loss among camels during the late advance of the three military columns. At the commencement of the campaign, it was computed there were 180,000 camels in the Punjab. The usefulness of these animals in ordinary times is very great, as in many districts of that wide region they form almost the sole means of transport, and when their numbers are diminished, so do the facilities for land carriage—a most essential item in the well-being of the Punjab, as of some other countries—decrease. As mentioned in this Journal, no fewer than 61,000 of these animals have been expended during the late operations—more than one-third of the number in the Punjab—and now that hostilities have been resumed, and transport is more than ever necessary, the immense and apparently unnecessary destruction of camels and other weight-carrying animals most seriously influences forward movements. We have dwelt in strong terms on the neglect of the Indian Government in this matter, and on its non-adoption of precautions which were suggested, and which were well within its means. We trust the lesson will not be lost, and that the government may show itself more in harmony with changed times, and recognise the necessities of modern warfare. India, of all countries in the world, appears to exercise the most powerful fossilizing effect upon the Western mind.

In addition to the mortality among the camels, the little war, of brief duration and insignificant marching, also entailed a loss of 32,000 transport and slaughter bullocks—chiefly, it is reported, from Cattle Plague and Foot-and-mouth Disease. In "Veterinary Sanitary Science and Police," and elsewhere, we have endeavoured to show that Asia, and more particularly Central Asia, is the home of these two scourges, of which we have so many painful reminiscences in this country. A most interesting and curious fact, and one which is unique, we believe, in comparative pathology, must be recorded. The *whole* of the elephants of the Kurum field force, one of the three divisions of the British invading army, suffered—many of them most seriously—from Foot-and-mouth Disease! The symptoms were very marked and unmistakable—saliva flowing from the mouth; feet swollen and showing open sores, the soles of the feet in some instances sloughing off, and carrying the toe-nails with them. All the elephants recovered. There was, of course, a

difficulty experienced in exploring the mouth, in order to determine the presence of vesicles or ulcers.

A number of cases of poisoning by "grass" occurred, and as a specimen of the plant has been forwarded to us, we shall again refer to this subject.

THE TRANSMISSIBILITY OF SWINE PLAGUE.

NOT long ago we announced that Professor Law, Veterinary teacher at the Cornell University, had successfully communicated Swine Plague, by inoculation, to a rabbit and a sheep; and the identity of the disease in these animals was proved by its re-transmission, in the same manner, from the rabbit to a healthy pig, when all the symptoms of the disorder were manifested by the latter. It appears that, since then, Dr. Detmers had observed a cow suffering from Pleuro-pneumonia, which had been sent to Chicago in a railway truck partially filled with swine, and the editor of the *Live Stock Journal* of that city suggested that it might be nothing more than communicated Swine Plague. To test the value of the suggestion, Dr. Detmers resorted to experiment, and we find the following in the *Chicago Daily Tribune* of July 12th :—

"In May last he bought two heifers, both in a capital condition of health, and inoculated in the ear both with the pulmonary exudations of hogs infected with the Swine Plague. The animals were then placed under careful scientific surveillance. In due time the heifers showed symptoms of disease; but the attack was a light one, and in the course of a few days the strong constitutions of the animals enabled them to throw it off. A second inoculation was performed. With the aid of a hypodermic syringe a drachm of the pulmonary exudation from a diseased pig, just killed, was inserted in one of the heifers, and half a drachm in the other. The pig was killed for the purpose, so as to escape all possibilities of Pyæmia. In the course of a week the disease, which in its symptoms indicated Pneumonia, was quite plainly developed. The attack, however, was a light one. July 3rd one of the animals was killed for *post-mortem* examination. Some morbid changes were found. There was a distinctly limited hepatization in several places in the posterior and anterior of both lobes of the lung. Serum was found in the chest and abdominal cavity. Nearly all the lymphatic glands were enlarged. Everything else was in its normal condition. The hepatization which was thus produced in the heifer by the inoculation from Swine Plague was almost identical with that which is one of the characteristics of contagious bovine Pleuro-pneumonia.

"Some time ago the English papers were filled with articles stating that cattle troubled with contagious Pleuro-pneumonia had arrived at Liverpool from the Western States. Prof. Williams, a well-known scientist in Edinburgh, who has devoted many years to the investigation of contagious diseases in the animal kingdom, contradicted the reports published in the English press. If the cattle came from the West, Prof. Williams, says Mr. Detmers, was undoubtedly right. The disease, which was pronounced contagious Pleuro-pneumonia, was not such, but an infection somewhat resembling it, and emanating from the Swine Plague. There are two ways in which the latter might be absorbed by cattle, either from scratches externally, or from feed and water internally. All the excretions from diseased hogs swarm with the *bacillus* germs, which are the primary cause of the plague. The commingling of one hundred hogs and fifty cattle in any yard or pasture would no doubt result in some of the latter becoming inoculated with the disease, provided any of the porcines were troubled with the Swine Plague.

"Prof. Detmers found that the disease communicated to the cattle by inoculation is of a mild type—in fact, so mild that its existence would not be noticed unless by close observation.

"In answer to a question propounded by the reporter, Mr. Detmers said that the disease was not dangerous. The heifers on which the experiment was made kept fairly in flesh. The temperature increased to 104·6° and 104·8° F. Respiration was accelerated, and the cattle acted a little dumpish.

"With the aid of a lancet some of the blood was obtained for microscopical examination. It was found to contain some of the *bacillus* germs, as in the diseased hogs suffering from the Swine Plague."

Our American cousins were at one time extremely anxious to make us believe that contagious Pleuro-pneumonia did not exist among their cattle, and they allowed our Government to declare the United States a "clean country," notwithstanding that we had years ago pointed out the existence of that disease there. Then, when it was at last discovered among their imported stock at Liverpool, everything was done to discredit the fact. It was soon found, however, that the contagion prevailed in several States—a circumstance well known for a long time to the veterinary profession in America, and energetic measures have since been adopted for its extinction, thanks to the action of the English Government. It is true that one or two veterinarians in this country denied that contagious Pleuro-pneumonia was present in one cargo of diseased American cattle, from their being unable to detect the characteristic lesions of the disease; but the balance of evidence was greatly in favour of its existence, and the arrival of other infected cargoes leaves no doubt as to the correctness of the opinion furnished by nearly all the experts called in to decide the question. Dr. Detmers fancies these cattle were suffering from Swine Plague, and states that the transmitted disease left lesions in the lungs almost identical with those of bovine contagious Pleuro-pneumonia. He evidently overlooks the fact that Professor Williams asserted that none of the cattle of the diseased cargo offered these lesions. There is no proof whatever that the cattle from the United States condemned in this country as affected with Lung Plague, had received the malady from diseased pigs; and we require far better evidence than Dr. Detmers gives to warrant us in believing that the Swine Plague is transmitted in any other way to other species than by inoculation, or that the symptoms and lesions of that malady are identical with, or even analogous to, those of the bovine scourge. Our own experience does not allow us to accept Dr. Detmers' hypothesis. We have repeatedly known the disease destroy nearly all the pigs on a farm, and though these animals associated more or less with the cattle, the latter remained unaffected. Some of the American cattle were most seriously diseased, and the malady from which they were suffering was, according to the weight of evidence, undoubted bovine Pleuro-pneumonia.

VETERINARY MEDICINE IN SWEDEN.

THE first veterinary school in Sweden was founded by Hernquist, who was born in 1726. After passing his examination as a doctor in philosophy, at the University of Upsala, Hernquist went, in 1763, to France, and more especially at Lyons studied veterinary medicine. In 1744 he established the Veterinary School of Skara, Sweden, and was designated professor of it in 1778, remaining in it until his death, which took place in 1808. He was a writer and practitioner of a very high order. One of the best of his pupils, Norling, took his place in 1814; and in 1820, by order of the Swedish Govern-

ment, he organised the Veterinary School at Stockholm, remaining director of it, as well as that of Skara, until his death in 1855. The Skara school served as a preparatory one for that of Stockholm, where the student, after a stay of two or three years, underwent examination for the degree of veterinary surgeon. At that time, as now, the students came from Sweden, Norway, and Finland, and during this period a great number of men belonging to each of these countries graduated at the Stockholm college.

In 1867, it was fixed by Royal Ordinance that before a student could enter that college he must have obtained the diploma of graduate in letters of the university. This excellent measure for the elevation of veterinary instruction was due to the initiative of Professor Landberg, and instead of diminishing the number of students, as some had predicted, it led to an increase. In requiring from candidates for admission to this school an amount of preparatory knowledge not demanded by any other veterinary school in Europe, the Swedish Government has taken care to protect the interests of its graduates and increase their income; the consequence is that the number of graduates has correspondingly augmented in quantity and quality. The candidate, twenty or twenty-one years of age, being a graduate in letters, is received into the Veterinary School, and there he has to study for four or even six years.

The school has four professors, each with an annual salary of about £230; a lecturer, with a salary of £168; an assistant or adjoint, and a teacher of farriery. Two of the professors, and the assistant, the farriery instructor, reside in the college; the others have a yearly lodging allowance of £28. The course of teaching at present is as follows:—

Anatomy, physiology, zoology, and pathological anatomy.—Professor Kinnberg.

Zootechny, sanitary science and police, and the ambulatory clinic.—Professor Morell.

Surgery, obstetrics, farriery and clinical surgery.—Professor Sjostedt.

Pathology, therapeutics, epizoöties, pharmacodynamics, pharmacotechny, and special clinic.—Professor Lindquist.

Botany, physics, chemistry, pharmacology and pharmacy.—Lecturer Ericsson.

The assistant aids in the clinic, and the other official instructs in farriery.

In Sweden there are thirty government veterinary surgeons, who receive an annual payment of £80, with travelling allowances.

The regiments in garrison have a regimental veterinary surgeon, who ranks as lieutenant, with a yearly pay of £170; and a batallion veterinary surgeon, with the rank of sub-lieutenant, who receives annually £112. Regiments of the line have regimental and squadron veterinary surgeons, the latter having the grade of non-commissioned officer, and yearly pay of £56. The number of civil and military veterinary surgeons under government is 170, and all, so far as their scientific duties are concerned, are under the direction of the medical authorities.

ON MATTERS OF AN HEREDITARY NATURE IN RELATION TO DISEASE.*

BY G. G. WHINCOP, M.R.C.V.S., NORWICH.

IN the consideration of this subject complete uniformity of opinion is hardly to be expected; neither is it right that each should view such a matter from

* Read at the meeting of the Norfolk and Eastern Counties Veterinary Medical Association on July 8th.

one point alone, for should the theory that we base our remarks upon be a wrong one, we are all in error, and it is by the dissemination of our different ideas that results of practical benefit to us all follow. Where I fail, for I do not presume to imagine that I have been able to avoid errors of many kinds, it will be my consolation to know that better men have not always succeeded; and I claim consideration for any faults and shortcomings that this paper may contain. If no seed be sown the corn will not grow; and as we daily advance in knowledge we note many circumstances relating to various disorders that we had left unheeded before, and without doubt the best way of obtaining an extensive knowledge of disease is to pay strict attention to the causes which operate in producing results of a morbid character that go by the name of disease, and perhaps affect generations of individuals. How susceptible our profession is to improvement and investigation we all know; and how hearty co-operation amongst its members is to be desired is patent to us all. Many and great advances have been made in Veterinary education of late years, and various schools have sprung up for the teaching of the student; yet many reforms are needed before ours can be called a united profession—endowed with a unity that would be to the advantage both of ourselves and the public. We have passed through the ages of darkness and superstition, yet we wage an unequal battle against ignorance; and an extensive illegitimate practice of veterinary medicine is still carried on by empirics in nearly every district of the country.

The natural inquiry we make in subjects connected with the profession should be of a useful character, entertaining to ourselves and profitable to us in the general pursuit of our vocation. We daily and hourly come in contact with something of an interesting character, and thoughts are momentarily passing through our minds which are capable of being matured and rendered beneficial to us; and yet often no trace is left behind, for the simple reason we do not accustom ourselves to dwell earnestly on such matters, or it may be that our daily routine of practice and cares, not always of a minor kind, drive such things from us. In turning over the leaves of a favourite author—say Shakespeare—what beauties in nature we have pointed out to us which we then recollect to have seen, although not noted before, but now that our attention is drawn to them we view such subjects with interest of no common kind.

The subject of hereditary diseases and peculiarities, the result of breeding, is one of real interest to us, and as such is well worthy of study. In the lower animals, as in man, we see the great resemblance reproduction produces. Shakespeare noticed this in "Titus Andronicus"—"But when the bull and cow are both milk white they never produce a coal-black calf" (act v., scene 1). There is scarcely an organ in the body that does not give proof of this peculiarity, and hereditary tendency to disease shows itself in the transmission of maladies from parent to offspring. Reasoning from analogy in the human subject, an animal that at birth more closely resembles one of its parents, should be found more likely to develop the peculiarities of its sire or dam, as the case may be. This can only be explained on the supposition that the internal organs, like the outer ones, bear a very close resemblance. We know that we can scarcely find any organ of importance that shows any signs of diseased action, but that the same is transmissable to descent. Indeed, judging from affections of the lungs and brain in man, we can come to no other conclusion than that the inner vascular structure, the blood-vessels and nerves, partake of this peculiarity. Taking the subject literally, we can, I think, prove that no organ or texture, however remote, is exempt from its chance of hereditary taint. Every part that is capable, or rather susceptible of deviations from the natural structure, is also capable of transmission to offspring, and of producing morbid effects. One of the singular

varieties of this principle is "roaring" in the horse. The peculiar affection which gives rise to this sound has sometimes been lost in one generation and re-appeared in the next, and that, too, most strongly marked. A variety of hereditary disease, in its partial or complete limitation to the male or female of any sex, although in the horse this is not so strongly marked as in man, the operation of castration often rendering a violent and obstinate animal really docile; whilst in a mare of the same breed the natural infirmity of temper still exists. In man we see hereditary traces of disease in whole families, and inquiries instituted have traced these various peculiarities through generations—tuberculous disease of the lungs, diseases of a scrofulous nature, and gout being especially well marked. What we may avoid in the lower animals by judicious commingling of sexes, can hardly, except in special cases, be observed in ourselves. We find yet this sound advice, though the application may not at all times be a matter of so practicable a character:—

"Marry
A gentle scion to the wildest stock,
And make conceive a bark of baser kind
By bud of nobler race; this is an art
Which does mend nature, change it rather, but
The art itself is nature."

What we may expect from a theory we find strongly developed as a fact. Some entire breeds of horses stand work well, others are what horsemen term "soft," and are subject to very early decay. In ourselves, disease of some important organ may exist, and yet be held in check by carefulness and conforming to certain habits. Thus a disease that would under ordinary circumstances develop, may slumber for years, indeed may never appear at all, unless some exciting cause is brought into operation. The general law is, that all bodily peculiarities tend to become hereditary; at the same time changes induced by external causes are supposed to have no effect on the progeny—at least not in the next generation. How this would act in time it is impossible to speculate upon.

One of the most frequent causes of "roaring" in the horse is hereditary; at the same time, we understand that all the progeny of an affected stock will not of necessity become roarers. Where a predisposition exists from a cause of this kind, any influence brought to bear is often sufficient to develop the disease. As an instance, exertion in young animals, perhaps a thickening of the mucous membrane of the air-passages as a result of inflammation; constriction or perhaps ulceration of some of the cartilages; or an effusion of lymph may have formed a false membrane, or even tight reining in carriage-horses. All these may be looked upon as exceptional causes, and are often accompanied by "thick wind," in which we find dyspnœa or shortness of breath, added to which the animal usually suffers from a cough, and that, too, of a peculiar sound. "A dry roaring cough" we find in some chronic cases of roaring of years' standing, with a considerable difficulty in coughing in the animal. This is from the sensibility of the larnyx becoming diminished, and is accompanied by paralysis of the left recurrent nerve, with wasting of the muscles of the larnyx as a consequence. These horses usually "grunt," as it is termed.

As a horse advances in years, "roaring" not only becomes worse, but animals so afflicted do not thrive so well as others, and are supposed by good authorities on the matter to be most peculiarly susceptible to disease.

The horses which become "roarers" are in exactly the opposite condition to those we find affected with "broken wind." This is more prevalent in thick-bodied, very coarsely bred animals, with short necks, thick-set ponies, cobs, and trade cart-horses; whilst "roaring" is almost limited to hunters,

carriage-horses of high stature, with long necks and narrow chests. An experienced eye may almost at a glance select animals which are subject to this malady. This disease, instead of having diminished of late years, is alarmingly on the increase. It has, so to speak, been growing on our horses. Many race-horses which have won considerable stakes have been "roarers," and go eventually to the stud; the consequence is that "roaring" is propagated through entire families of race-horses. Some of their progeny, from either being too "slow" to train, or from want of staying powers, or having some infirmity to prevent their chance of winning a stake—if mares, degenerate into hacks or cheap hunters; and if stallions, are employed to cover the mares in the neighbourhood for a trifling fee to the groom—completely gratifying their owners' ambition, for these stallions, being handy, are readily made use of by inactive breeders. In this way the affection is persistently maintained. The late Professor Spooner was strongly of opinion that two-year-old racing was the exciting cause of this disease. Personally, I have no doubt he had good grounds for the opinion he had formed, matters of this kind frequently coming under his observation.

In 70 per cent. of the *post-mortem* examinations made, we find the larynx affected. This is real hereditary "roaring"; at the same time, I do not say that the recurrent nerve may not be paralysed, and wasting of the muscles be the result, without hereditary taint. "Roaring," arising from obstruction in the trachea by mechanical means, the consequence of disease, as Influenza or affections of the lungs, tumours in the nostrils, etc., may be looked upon as exceptional, although abnormal sounds are produced. Tight reining is a frequent cause, as it impedes respiration, and the horse works uncomfortably from the unnaturally curved position of the trachea. It is by no means a pleasant sight to see these wretched animals, in our great cities and towns, reined up so tightly to gratify the morbid fancy of the well-to-do public.

The next object of importance for consideration, and really the greatest of all, is the part the blood plays in the transmission of disease and defects. That a fluid ever in motion should perpetuate in the solids of the body, peculiarities in structure, cannot fail to strike our notice. This so-called vital fluid is certainly the support of life in the different structures; for mortification soon follows when the circulation is long cut off from any part. This fluid, whilst supporting the life of the solids of the body, is losing its own; and to accomplish this giving of nutrition it must have motion in a circle, in the continuance of which it is super-saturated, as it were, with fresh living powers,—having parted with its nutrition when it visited the various parts. The general way of viewing this subject, is in regarding the conditions by which this fluid is transferred from one part of the system to another, producing sometimes local excess, or even deficiency, as the case may be. That there should be a natural balance or proportion of blood to various parts of the body is certain, and that there are often deviations in circulation without producing anything really prejudicial to an animal's life, is a fact; for instance, local inflammation arising from external causes.

The definite conclusion we arrive at, is that the constitution and temperament of the offspring are very nearly allied to those of the parent, and that every disorder, whether congenital or acquired, adds more or less, in time, to the list of hereditary diseases. Not that an animal may be actually born with the diseases to which its "sire," or "dam," are liable; this in the lower animals is rarely remarked, although in the newly-born infant, the offspring of a consumptive mother, tubercles in the lungs are often present. In our practice, however, animals are usually born free from disease, but the predisposition of the young animal usually shows itself at certain ages, depending on the nature of the malady. Too early work is most influential as a predisposing cause;

where active exertion is required in a young animal, exostoses, enlarged joints, and rapid wear of the limbs is a result—splints, spavins, ringbone, curbs, dropsical condition of synovial cavities, scrofulous disease of joints, shivering, diseases of the eye—as cataract and constitutional ophthalmia—diseases of the feet generally, more especially navicular disease. In disease of the foot, hereditary taints may be strongly marked, but disease does not of necessity follow. When we get a morbid change in the structure of the foot, so that it becomes upright, the sole more concave, and the hoof generally of a "blocky" character, these are conditions which are the marked effects of the disease, and are nearly certain to manifest themselves in another generation. Again, in spavin, we see cases of hock lameness of considerable importance, yet no bony enlargement; and, on the contrary, cases daily occur where we have an enlarged hock, yet no existing lameness. That this has become a disease of an hereditary character, does not, I think, admit of a doubt. I do not know how we can better consider the hereditary peculiarities of animals than by commencing with our old domestic friend the hog—the cottager's friend, as he is sometimes termed; although, from my experience, the good old days of the farm-labourer with the pig-sty and "pightle of land" (I use a Norfolk phrase) are nearly gone, I fear, for ever.

Dr. Pritchard relates some very interesting instances of structural changes and hereditary instincts of domesticated animals. He says: "Swine transported from Europe to America, since the discovery of the Western Continent by the Spaniards in the fourteenth century, and wandering at large in the vast forests of the New World, and feeding on wild fruits, have resumed the manner and existence that belonged to the original stock. Their appearances now closely resemble the wild boar. Their ears have become erect; their heads are larger, and their forehead vaulted at the upper part; their colour has lost the variety found in the domestic breeds. The wild hogs in the American forest are uniformly black; the hogs which inhabit the Paramas bears a striking resemblance to the wild boars of France. The restoration of the original character of the wild boar in a race descended from domesticated swine, removes all reason for doubt as to the identity of the stock. The restoration of one uniform black colour, and the change of thin sparse hair and bristles for a thick fur, are facts that cannot fail to be noticed."

A very remarkable fact relative to the oxen of South America, is recorded by M. Roulin. In England the milking of cows is continued throughout the whole period from the time when they begin to bear calves until they cease to breed. This secretion of milk has become a constant function; it has been rendered such by the practice, continued through long series of generations, of continuing to draw milk long after the period it is likely to be wanted for the calf. The teats of the cow are longer in proportion, and the secretion is perpetual. In Columbia the practice of milking cows was laid aside, owing to the great extent of farms and other circumstances. In a few generations the ordinary structure of the parts and the natural state of the function have been restored, and now the secretion of milk in that country is contemporary with the actual presence of the calf. If the calf dies the milk ceases to flow. This testimony is highly important, from the proof which it affords that the permanent production of milk in the European herds of cows, is induced by an artificial habit, continued through several generations.

Again, the horses bred on the grazing-farms of the tableland of the Cordillera are carefully taught a peculiar pace, which is a sort of running amble. This is not their natural mode of progression, but they are inured to it very early, and the greatest pains are taken to prevent them moving in any other gait. In this way the acquired habit becomes a second nature. It happens occasionally that such horses become lame, and are no longer fit for use. It is

then customary to let them loose, if they be well-grown stallions, into the pasture-grounds. It is constantly observed that these horses become the sires of a race to which the ambling pace is natural, and requires no teaching. The fact is so well known, that such colts have received the special name of "Aquillas."

The habit of the "setter dog"—his stopping, crouching, and backing in the pursuit of game, is familiar to us. This, by constant teaching, has become hereditary to such an extent that the first time a well-bred young dog is taken in the field, it is nothing uncommon, as soon as he gets on the scent, for him to stand and remain immovable, till instructed to proceed. This can be nothing but hereditary idiosyncrasy, and a remarkable and interesting argument in its favour. Speaking of dogs, Dr. Pritchard relates that the breed of that animal found on the banks of the river Madeline, and which are employed in hunting the Beccari—a small wild hog—are attached to each other and will hunt together, but the moment a strange dog comes in their way, they will attack the same with ungovernable fury, and notwithstanding the efforts of the hunter, who at other times has perfect and complete control over them, they will immediately destroy any dog belonging to an alien race.

And the sheep, which we can only look upon as one of our oldest domesticated animals, exhibits a great variety of form, new breeds being frequently produced in different counties, in which particular qualities predominate, according to the preference and judgment of the breeder. This is effected partly by crossing or intermixing races already well known, and in part also by selecting an individual animal from the stock, in whom some particular qualities are more strongly marked than in the generality of the same breed. In these instances, the natural or congenital variety or particular excellence in form that an animal displays, most likely for the first time, becomes perpetuated by hereditary transmission, which is a law in the animal economy.

The question of breeding animals demands no little attention from us, whether we breed a horse for the chase, for commerce, or for agricultural purposes. The horse-shows held in nearly every county in England have done good work, by encouraging a system of rivalry or, more properly, emulation amongst gentlemen who have both the will and means to produce good animals of every class. I have known several really unsound animals to travel in this vicinity. One of the worst "roarers" I ever heard was a very favourite animal amongst farmers for years; they patronised him extensively, because his stock was large, with plenty of bone and substance. Certainly we have as many roarers in this county as one would care to meet with; and until the agricultural community can be persuaded of the baneful effects of animals of this kind, we are always certain to have a good number. There are hundreds of individuals who are continually increasing the number of horses, without any idea of the qualities the sire or dam should possess. The result is an increase of animals that are of no real value. Some will not pay the price for first-class stallions; and many more have become tired of paying for the use of these animals, with such an uncertain result; while if we take into consideration how severely these travelling stallions are worked in the season, we can hardly wonder at the defects in the progeny. The horse becomes exhausted from too frequent copulation and constant travelling; the consequence is that the provisions of nature are inadequate to provide for a process so debilitating, and the animals become uncertain foal-getters, or they produce only weedy animals. The greater the superiority of the male over the female, the more will the produce partake of his character. This, as we know, applies not only to the horse, but to other animals, oxen and sheep coming more particularly under our notice. This we acknowledge in England as the most powerful means of preserving or regenerating stock. I think a great argument in favour of the sire in having a more powerful

effect than the dam is, that if a she-ass is covered by a horse, the offspring is a mule that more closely resembles the horse rather than the ass in shape, but in height it is more like the latter; while a mare covered by an ass gives the proper mule, which is more like its sire in form and temper, and the dam in height and size. Food and climate may modify these results, but will not destroy the principle. The whole secret of our success in breeding is the well-combined introduction of original blood from the best sources, and hence our superiority.

That good horses are always worth money is a fact—that is, horses with blood, muscle, and high action; but the fluctuation in the price of horses depending on causes wholly beyond the power of the breeder, is a curious fact. A few years ago, horses were scarce, but now, owing I think to large imports, the country is full of them, and middle-class horses sell at a price that cannot recuperate the breeder.

What we require is plenty of bone, strength, and robustness. Our aim must be to breed horses of size and power. In this part of England we are well favoured with marshes of luxuriant herbage, well calculated to promote the necessary building up of the system; and here in the eastern counties, Norfolk has always held its place at agricultural gatherings. In conclusion I can only lament the present agricultural depression. Farmers are now passing through very trying and anxious times, and must endeavour by judicious breeding to counterbalance the low price of general produce. These bad times for farmers, as they are called, affect us also indirectly. Agricultural and veterinary science are related to each other so closely.

The veterinary profession has had a long up-hill fight for its existence. A man can never war with so contemptible, and yet so powerful a foe as ignorance. As a profession we have grappled with and routed superstition, and prejudices of many kinds are fast giving way.

PATHOLOGICAL ANATOMY OF RABIES AND HYDROPHOBIA.

KOLESSNIKOFF (in the *Centralblatt für Chirurgie*) examined the bodies of two pregnant bitches which had been rabid. He found a parenchymatous inflammation of the uterine mucous membrane and its glands. From this tissue the inflammation had invaded the placenta, then the internal organs of the fœtuses—the liver, cells of the pulmonary alveoli, lymphatic corpuscles of the spleen, and the glands of the mucous membrane of the stomach and intestines.

The muscles were normal, but the kidneys exhibited the first stage of the parenchymatous Nephritis which, according to Rudnew, is constantly met with in rabid dogs.

Botkin (*Rec. des Sciences Méd. en France et à l'Etranger*) describes the lesions found in the brain and cardiac ganglia of a woman, thirty-two years of age, who was bitten in the lower lip by a dog on July 9, 1875, and died on September 23, after two-and-a-half days' illness. On examining the nervous centres, the following changes were noted:—Some cells of the medulla oblongata were turbid, and their contours were indefinite; in the interstitial tissue of the brain there was a great quantity of white corpuscles in the perivascular sheaths or their vicinity. Some of these corpuscles were situated in the pericellular spaces, and they were found even in the protoplasm of the cells. There was dilatation of the blood-vessels, which were filled with corpuscles; but the most interesting discovery, in the estimation of Botkin, consisted in the presence of a brilliant and strongly-refracting substance, collected principally in the perivascular spaces, and especially in the superficial layers of the cerebral hemispheres. This substance was in places agglomerated around

the vessels in such abundance that the latter appeared to be obliterated or strangulated. In other places they were disposed somewhat regularly around the blood-vessels, so as to appear like epithelium. Resisting the action of staining fluids, they remained insoluble in acids and alkalies.

In the ganglia of the heart the following lesions were observed: Swelling of the endothelium lining the sheaths of the nerve-cells, and in the interior of these cells, as well as in the interstitial tissue, round elements the size of white corpuscles. The nerve-cells were turbid, so that it was impossible to perceive the nucleus. An alteration which was always present consisted in the nerve-cells never completely filling their sheath, but remaining separated from it by a space which only traversed the prolongations of these cells.

The author calls attention to the fact that Lubimoff had pointed out an identical appearance of the cervical and sympathetic ganglia in a case of Œdema. It therefore appeared to him to be necessary to discover if, in the present instance, there had not been an infiltration which dilated the sheath of the cell, or rather a retraction of the cellular protoplasm. Micrometric measurements, however, permitted him to ascertain that the cell had preserved its normal dimensions, and that the sheath was dilated—a circumstance explained by the laxity of the tissue enveloping the ganglia of the heart, and the great vascularity everywhere around them.

Monin, in the *Archiv für Veterinarmedicin* of St. Petersburg, has made eighteen observations on rabid dogs, and gives the following propositions:

1. Rabies in the dog is a febrile disease, the temperature rising to 39° and 40°. Before death it often falls to 26° by a regular decrease. Death always occurs at the moment when the lowest temperature is reached.

2. The density of the urine and its richness in urea are at first increased; they diminish a short time before death, while, on the contrary, the proportion of salts, and particularly phosphates, and sulphates, is greater. The urine contains albumen and the colouring matter of the bile.

Proceedings of Veterinary Medical Societies, etc.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this association was held at the Medical Institute, Hope Street, on August 15th, 1879, JOSEPH WELSBY, Esq., President, in the chair. The following gentlemen were present: Messrs. Morgan, Reynolds, Elam, Simpson, and Stevenson, of Liverpool; Professor Walley, Veterinary College, Edinburgh; Dr. Greenway, West Derby; Messrs. T. Greaves, Manchester; B. Kettle, Market Drayton; A. H. Darwell, Northwich; J. P. Young, Clitheroe; W. G Dixon and J. S. Menzies, St. Helen's; E. Langford and John Pilkington, Veterinary Students; a friend, and the Secretary. Letters of apology were received from a number of members and gentlemen who regretted their inability to be present, owing to some other meetings of a public character being held on the same date.

The minutes of the previous meeting were read and confirmed. Mr. T. E. J. Lloyd, Chester, was elected a member of the Association.

A letter from the Secretary of the Medical Institute, relative to a proposed donation by the Association to one of the medical charities of Liverpool, was read and discussed, when it was unanimously agreed to send a donation to the Children's Infirmary of Liverpool.

Professor WALLEY then read a paper on "Ammonia: its Uses in Practice,

with a consideration of the Stimulative System in the Treatment of Disease."*

Mr. THOMAS GREAVES, in opening the discussion, said their thanks were due to Professor Walley for bringing such a very interesting and practical paper before them. Ammonia had been a great favourite with him ever since he entered the profession, and he did not consider that Professor Walley had over-estimated its therapeutical value in the least, notwithstanding the very high praise which he had bestowed upon it. Liq. ammonia fort. had formed one of the ingredients of his colic draught for forty-five years, and he considered that with the carbonate of ammonia one can accomplish everything that may be effected with calomel: viz., increased action of the secretory organs, and even purging, without producing that nausea which accompanies the administration of that drug. In low fevers in horses and cattle, carbonate of ammonia is of great value, and if there is a fœtid condition of the mouth accompanying any disease, this medicine, given in solution, will remove the condition immediately. He had observed, however, that after its administration for some time the venous blood became darker, and in some cases animals died from apparent syncope—in his opinion, by this darkening and thickening of the blood following the administration of carbonate of ammonia.

In making a *post-mortem* examination of such cases, the arteries were found to be full of black blood. He would like to hear Professor Walley's opinion on that point.

Mr. MORGAN said that he used to have great faith in external stimulation, but he did not rely on it so much now, especially in Pleurisy and Pneumonia. He did not approve of applying mustard even in those cases, and he could not see the force of the Professor's recommendation to bleed and apply external stimulants during a crisis in such cases. As to giving liq. ammonia fort. in a colic draught, it required so much care in measuring the dose, and having it properly diluted to prevent excoriation of the mouth, that it was a very dangerous remedy for ordinary use. He preferred the spt. ammon. arom. In cattle practice, good whisky was an excellent stimulant, and the Professor would find that in Scotland it was generally very handy. He concluded by thanking the Professor for his very practical and exhaustive paper.

Mr. STEVENSON said that while he could not but express his admiration of the paper which they had heard, yet he could not agree with the Professor in recommending that ammonia be given along with alcohol, as their physiological actions are quite opposed to each other—ammonia being given as an antidote for an over-dose of alcohol.

Mr. T. GREAVES, in explanation of Mr. Morgan's remarks, said that he had experienced no bad results from the administration of liq. ammonia fort.; he administered it in half-drachm doses in a pint of water, and if that dose did not accomplish the desired effect he increased it from half to double that quantity. When you excoriate the mouth and thus stimulate the buccal and entire mucous membrame, your patient generally does well. If you mix ammonia in linseed oil it does not produce the same beneficial effects. In Parturient Apoplexy he considered that the carbonate of ammonia was a better stimulant than whisky—he had given as much as two ounces every hour for six hours to a cow.

Dr. GREENWAY referred to the tendency of the human mind to rebound from one extreme to another, and in nothing was this more manifest than in the history of medicine. Fifty or sixty years ago phlebotomy was almost

* This Paper appears as an original communication in the present issue of the Journal.

universally resorted to for every kind and character of disease, and at the present time it was just as universally abandoned. He considered this was a great mistake, and related the history of a case of Bronchitis which came under his care when a young practitioner, which convinced him that phlebotomy was of great value when judiciously resorted to. In this case expectorants were tried, the inhalation of steam and the stimulative system of treatment adopted, but with no beneficial results, he then determined to try phlebotomy, followed by the internal administration of ammonia, which produced immediate beneficial results, the patient finally recovering. The blood when first drawn was very thick and syrupy, but it gradually became brighter. When the bronchial tubes are blocked up with gelatinous mucus, the blood becomes carbonised; no air can reach it, and internal congestion follows. This condition is relieved by phlebotomy, the heart is assisted, the blood becomes arterialized, the lungs relieved, and the viscid mucus is expelled. In reference to ammonia as a general stimulant, he considered that in human practice they had a better stimulant than carbonate of ammonia in sulphuric ether. Alcohol dried up the secretions, but ether stimulated the secretory organs, even better than ammonia, and in some forms of disease of the kidney—such as the "white fatty degeneration" in which the urea in the blood became decomposed into carbonate of ammonia in the kidney, the administration of carbonate of ammonia is inadmissable.

Mr. WELSBY, the President, referred in appreciative terms to the excellence of Professor Walley's paper, and said that, although he could quite understand the benefit arising from the combined effects of phlebotomy and ammonia, he could not fully see the advisability of combining two such antagonistic remedies as aconite and ammonia recommended by Professor Walley in his paper.

Mr. ELAM said that it was fourteen years since he had discarded alcohol in favour of ammonia; in Parturient Apoplexy he had found ammon. carb. an invaluable remedy. He related several cases illustrative of its beneficial effects in this disease. He gave as much as four ounces of the carbonate of ammonia in one draught to a cow before going down. There was no risk in cattle of injuring the buccal membrane. Referring to Mr. Morgan's remarks on external stimulation, he said that in acute Pleurisy and pneumonia he placed great reliance on the external application of mustard in every case. He had never given aconite with ammonia, but he failed to see any reason why the action of aconite should be different when combined with carbonate of ammonia in the solid form, from its action when administered with the same medicine in the liquid form. In torpidity of the bowels he had found that a ball composed of aloes ʒj, ammonia carbonate ʒjj, and repeated for several mornings, acted very much more satisfactorily than the ordinary physic ball.

Mr. B. KETTLE, in a humorous speech, related the history of a case of inflammation of the bowels in a horse, which very forcibly pointed to the beneficial effects of large doses of liq. ammon. fort. At first he administered some appropriate medicine, and desired to be informed in three hours how the horse was. A messenger came and reported that the animal was no better. He then prepared some ammonia liniment, to be applied to the abdomen, and a powder which was to be administered in a pint of warm water, stating that he would see him soon after. When he arrived, he found the horse standing with his tongue hanging out its full length from his mouth and completely stripped of its mucous covering; the whole of the buccal membrane was also removed. On making inquiries as to how this was brought about, he ascertained that the animal had received the ammonia liniment as a draught, and the powder had been rubbed on his belly. The pain ceased immediately after the draught was given. He

(Mr. Kettle) was at first very much alarmed at the probable result; however, the case terminated favourably. As to the beneficial effects of ammonia in Parturient Apoplexy, he had given both ammonia and whisky, separate and combined, but under either mode of treatment he was sorry to report a large percentage of deaths.

Mr. WELSBY, referring to Parturient Apoplexy, said that he had been induced to try *ergot*. In one case he gave two drachms of strong solution in half-a-pint of gruel; the animal was almost comatose; half-an-hour afterwards she became very excited—almost mad; she continued in that state for about two hours, after which she became quiet, and finally recovered. He treated other two cases in the same manner, but both died. He then treated other two cases by the hypodermic injection of *ergot*, one of which recovered. Reasoning from his experience, and the physiological action of *ergot*, he was inclined to recommend it for further trial. He was also very favourably impressed with the benefits likely to be derived from the intra-venous injection of ammonia in this disease.

Mr. REYNOLDS expressed his regret that, owing to some other public meetings, Professor Walley had not a better audience to listen to his very excellent paper. In regard to the intra-venous injection of ammonia, he should like Professor Walley to enlighten them a little more in detail as to the dose, the strength of the solution, and the general mode of procedure; also, if he thought that in cases of blood-poisoning from wounds in the feet of horses, that the intra-venous injection of ammonia would be beneficial.

Mr. GREAVES said that he did not think that in those foot cases death was caused by absorption of matter or blood-poisoning; but that it was due to chronic disease of the lungs, or other internal organs, which existed concurrently with the injuries to the feet. In regard to the beneficial effects of bleeding, he related the history of a case of chest influenza in a horse. This animal had been ill for five days; had eaten nothing for three days; pulse 96, etc. The late Mr. John Lawson saw the case with him. Mr. Greaves recommended bleeding, but he strongly objected to it. The horse made no improvement, however, and on the following day he was bled, six quarts being abstracted. When Mr. Lawson was told what had been done, he said the patient was almost certain to die. The horse was visited six hours later, and he looked livelier; and in other six hours his pulse was down to 86, after which he gradually improved and finally recovered. Phlebotomy relieved the congestion that existed somewhere, and gave nature a chance. But while he admitted that a great change had taken place in our mode of treating diseases, he was also of opinion that the character of the diseases themselves had changed.

After some remarks from the SECRETARY—who had expressed the hope that Prof. Walley would publish his paper, the President called on the Professor to reply.

Professor WALLEY said that he was obliged to the President for giving him the opportunity of coming to read a paper, and to the members for the appreciative reception they had given it. He then referred to the various criticisms and questions of the members. As to the best mode of administering ammonia or its carbonate, he preferred giving it in solution—when this could be done conveniently—but it must be diluted so largely, that it is difficult to administer in some cases. As to the reason why ammonia and aconite cannot be administered together in solution, it is because the action of aconite becomes thereby increased to such a degree that symptoms of poisoning manifest themselves almost before the medicine is swallowed.

It is the same with potass and aconite in solution. These agents seem to favour the absorption of the aconite. As to animals dying with their arteries full of black blood after the continued use of ammonia, referred to by Mr. Greaves,

the continued use of ammonia would produce fluidity of the blood, and in large doses solution of the hæmoglobuline, and thus prevent the oxidation of the blood, but he was strongly of opinion that the character of the blood in these cases was due to the disease rather than to the administration of ammonia. In regard to the benefit of external stimulation referred to by Mr. Mr. Morgan, people become disgusted by seeing stimulation over-done, some practitioners persisting in applying irritants during the whole couse of the disease ; but in the early stages, or at a turning point of the disease, external stimulation is of decided benefit—the nerve centres being stimulated. The Professor here related the history of several cases in which marked benefit was derived from abstracting blood, and following up that by internal and external stimulation. As to the apparent contradiction in combining alcohol with ammonia, in many cases when two agents are given, which individually have an opposite effect, there is a beneficial result—such as in the combination of *opium* and *belladonna*. Ammonia is a respiratory stimulant, The same remarks apply to the combining of ammonia with aconite, Aconite reduces the temperature, while alcohol is more a cardiac stimulant, having a powerful sedative effect on the heart, while ammonia stimulated the respiratory functions.

He quite agreed with Dr. Greenway, that sulphuric ether was particularly useful in inflammation of the lungs ; but it was inadmissible in cattle practice generally, from the odour, etc., left in the meat should the animal require to be killed. On the other hand, disease of the kidneys was not so common among the lower animals as in man, and consequently there was not the same objection to the administration of ammonia to them. As to the doses and dilution of ammonia for the horse, he gave one half-drachm of liq. ammon. fort. in a pint of water, or ammon. carb. ʒj. aqua Oss. For cattle, from 3 to 4 ounces of the ammon. carb. may be given without any risk of excoriating the mouth.

In giving liq. ammonia fort. for colic, one may almost judge of its beneficial action by its effect on the mucous membrane of the mouth. He never doubted a favourable termination when the mouth was excoriated by the medicine. Ergot of rye is used in parturient convulsions, and might be recommended for trial in Parturient Apoplexy. It acts on the brain and spinal cord. As to the method of intra-venous injections : first put the finger on the vein, but not too firmly ; or insert the needle in it and draw the piston ; the blood will show that the vessel is penetrated. From ʒss. to ʒj. of liq. ammon. fort. may be injected into the circulation ; it need not be much diluted. The characters and types of diseases change—they assume a different character in one year from that which they bear in another. He did not, however, think that this was due to altered feeding, etc., so much as to the different constituents in the same kind of food—due to our altered mode of cropping, and to our changed system of agriculture generally.

Mr. HUTCHEON proposed, and Mr. ELAM seconded, "That Professor Walley be requested to publish his paper." This was carried unanimously. Professor Walley having agreed to comply with the request, a cordial vote of thanks, on the motion of the President, was accorded. A vote of thanks to the President closed the meeting. DUNCAN HUTCHEON, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE first quarterly meeting of this Association was held in the Douglas Hotel, Newcastle-on-Tyne, on Friday, August 29th, Mr. D. Dudgeon, the President, in the chair. The following members were present :—viz., Messrs. W. J. Mulvey, H. Hunter, G. Elphick, J. Corbett, A. L. Butters, A. Hunter, D. Macgregor, W. Wheatley, M. Hedley, W. S. Pringle, C. Stephenson, J.

Anderson, J. Gofton, and the Secretary. Mr. W. Williams, jun., was present as a visitor. Letters of apology for non-attendance were received from Professors Williams and Pritchard, and Mr. J. Malcolm.

The Committee elected for the revision of the rules presented its report, which with a few alterations was adopted.

Mr. G. ELPHICK then read the following paper on "Some of the Diseases of the Bowels as Affecting the Horse":—

Mr. PRESIDENT AND GENTLEMEN,—Having been solicited by our worthy Secretary at the eleventh hour to read a paper, I have selected to bring before your notice some of the diseases of the bowels as affecting the horse.

I should have liked to have given you something perhaps more interesting, but the notice I received being so short and time limited, I took the liberty of thinking that one and all of you would kindly assist me in my undertaking.

You will, I am sure, agree with me that these are diseases to which the lower animals are very subject, especially the horse, but not so common now as they were in former days, thanks to science—I think I may justly say veterinary science—also to the better management and feeding of horses. I do not intend to give you an elaborate paper, neither shall I give you all the diseases to which the bowels are liable, but confine myself to the most important ones—viz., Indigestion, Impaction of the Stomach, Constipation and Obstruction, Spasmodic and Flatulent Colic.

These diseases occur most frequently during the winter months, and at the change of seasons, and are generally the results of errors in feeding. Horses are, as a rule, best kept in health when fed upon food requiring thorough mastication; we find when horses are properly fed the stomach seldom suffers from disease. Give a hungry horse a feed of cooked meal or a mash, which is eaten very heartily without mastication, and we get an acute case of what is generally called Gripes. I have no doubt it is badly griped, and unless it gets immediate relief the case terminates fatally from a ruptured stomach. Doubtless many of us have been called in to make *post-mortems* upon horses that have been found dead in the morning, which were left in perfect health the previous night, and upon inquiry the horse has been a long journey, got home late, had a mash, and was left for the night. On making a *post-mortem*, the stomach is found ruptured and full of non-masticated food. In many of these cases, where no *post-mortems* are made, the poor animal gets the credit of having hanged itself.

The first disease to which I shall call your attention is

Indigestion.

This arises from various causes, such as the process of dentition, diseases of the teeth, ravenous feeding, improper food, or food given at improper intervals, or from some constitutional predisposition. In young animals it is generally caused by removal from the dam at too early an age, draughts of cold milk, or sucking when the dam is heated by working too soon after the birth of the offspring.

Symptoms.—Loss of appetite, or capriciousness and depravity of it, the animal eating at irregular intervals, or having a desire to eat filth; the tongue is white and pasty, with a bad smell; often a dry cough, hide-bound, a dry scurfy skin; stretches out the nose, and retracts the upper lips; irregularity of the bowels, and occasionally pawing with one or both fore-feet. If caused by imperfectly masticated food, the oats and hay, or whatever the animal is fed upon, will be found in the fæces. The fæces often resemble the colour of the food. In young animals the above symptoms are generally present associated with Diarrhœa; and if fed on milk the fæces often resemble it in

colour and consistency, and are generally fœtid. Should these symptoms in aged animals have spread over a considerable period of time, Diabetes often sets in; colicky pains may also be present in some cases, especially a short time after being fed.

Treatment.—If possible find out the cause and remove it, this generally in the earlier stages effecting a cure; if due to the process of dentition, the presence of unshed temporary teeth, or any irregularity of the permanent ones, should be treated by the ordinary method; if from improper feeding or bad food, a complete change of diet is generally all that is required, care being taken to give food easily digested and good. In some cases where the cause in operation cannot be detected, I would recommend an alteration in the diet; in all cases where Diarrhœa or Constipation is present, it will be advisable to give a mild aperient. I prefer linseed oil before any other; aloes, I think, are too irritating, frequently causing colicky pains and super-purgation, which leaves the animal very weak, often taking months for it to regain its former strength. After the laxative has operated, or if the state of the bowels requires no opening medicine, I find alkalies alone, or combined with vegetable tonics, most beneficial, improving the appetite, counteracting the acidity and strengthening the gastric apparatus; in some cases the alkaline treatment fails, when I have found the use of nitro-muriatic acid proving beneficial. I have also had good results from allowing the animal to eat soil, such as grass sods, or when at exercise allow it to help itself, which it does greedily. In foals and calves I find carbonate of magnesia combined with stomachics most useful; a piece of chalk or rock salt placed within their reach often does good, in fact they should never be without one or the other. In indigestion occurring in the winter and when the hair is long, clipping frequently proves beneficial, restoring health in a few days after every other remedy has failed. In all cases, dieting, pure air, gentle exercise and good grooming are to be strictly looked after, even in health.

Impaction of the Stomach

is caused by food too abundant in quantity or greedily swallowed and imperfectly masticated; this is often seen where horses are fed on cooked food. Deaths from this cause are very common; some foods are also very dangerous for the horse, such as wheat and barley, causing deranged stomachs, Laminitis, and death, and should not be given as an article of diet. I have also seen bran, when given in large quantities, prove fatal, causing Impaction and Rupture.

Symptoms.—Flow of saliva from the mouth, nostrils dilated, anxious countenance, eructation of gas, occasional attempts at vomition, fulness of the abdomen, colicky pains, pawing with the fore-feet, keeping the head pressed into a corner, or if in a stall, under the manger, partial sweats, afraid to lie down, and when down lies but a short time. In the latter stages we have the peculiar catching breathing, discharge from the nostrils of the medicines we have attempted to give, walking round the box until the last, when everything seems to give way, and the animal falls to rise no more from ruptured stomach.

Treatment is in most cases not very successful, as we are seldom called in during the earlier stages. I have had most success with linseed oil, ammonia or turpentine, and enemas, care being taken not to allow the animal to lie down suddenly. I have also had good results from a little gentle exercise, and if much pain was present gave the tincture or extract of belladonna by itself, or combined with opium.

I shall consider the next two diseases together as they are closely allied, viz.:—

generally affect the large intestines, and may be looked upon more as symptoms of than diseases, and result from debility or paralysis of some portion of the intestines. Animals over-abundantly fed, or kept upon food containing too much woody fibre, are more liable to suffer. In some cases the bowels are naturally torpid.

Symptoms.—When arising from paralysis, one diagnostic symptom is absence of intestinal murmurs; and if affecting the large intestines, a dilated non-contractile condition of the rectum when the hand is introduced. If due to impaction from errors of feeding there is general abdominal pain, the animal often stretching itself out in a similiar position to that seen in the act of urination, paddling with the hind-feet, whisking the tail, and keeping it close between the hind-feet; at times it will stand for a considerable period apparently easy, at other times lying stretched out for twenty minutes or even half-an-hour, and occasionally looking back at its flanks. There is a tendency to resist by straining the introduction of the hand and injections into the rectum, also enlargement and distension of the abdomen; in many cases impacted masses can be felt by the hand when examining *per rectum*, and when the hand is withdrawn it is generally covered with mucus.

Treatment.—Constipation, when arising from paralysis of the bowels, is best overcome by stimulants and nervine tonics, with an occasional dose of opening medicine, and by the administration of enemas; if from a torpid state of the bowels, alkalies are to be given, with occasional cold bran or linseed mashes, and sparingly supplied with hay.

I think, gentlemen, you'll agree with me that Impaction or Obstruction of the bowels requires very careful treatment, and a large amount of patience. We are very anxious that our patients should recover as soon as possible, and the owners are generally very fidgety, consequently we are apt to give too much medicine, and instead of our patients dying of the disease, they die of the treatment. After giving a certain amount of medicine we ought to leave the rest to nature. As a rule they are lingering cases, often extending over a period of five or six days—one case which I remember lasted eleven days, and recovered. The great danger to be guarded against is Muco-enteritis, and Rupture of the bowels.

In these cases I have had the greatest success from linseed oil—if much pain was present I have given opium or belladonna, or both together; also subcutaneous injections of morphia or atropia, or the two combined. I must say I am very partial to belladonna in these cases, as it is a laxative, and relieves pain and muscular contraction. Opium is too constipating, and I think often counteracts the effects of any opening medicine that is given. I have no doubt in my own mind that when the bowel becomes impacted, there is a tendency to contraction of the muscular coat of the intestines.

I remember a case of obstructed bowel which terminated fatally from a huge calculus in the rectum. In this case, no matter what I gave the animal, it got no relief until I gave a large dose (1 oz.) of the extract of belladonna. It seemed to act like a charm, the pain subsided, and I heard what I like most to hear in these cases, intestinal rumblings, and the animal passed a large quantity of gas. This state of affairs only lasted the time the animal was under the influence of the drug. I feel confident if this had been an ordinary case of impacted bowel the animal would have recovered.

In these cases, and I think I may safely say in all cases where the bowels are affected, aloes should seldom or never be given; undoubtedly aloes in a ball is the most convenient way of administering opening medicine, and in this form is easiest given. The great objection I have to aloes is its tendency to irritation and exciting the bowels to undue action. If opening medicine is

necessary linseed oil is to be preferred. Perhaps some of you will say linseed oil is very difficult to give to some horses, and that you cannot determine the quantity they have got. With linseed oil I think you need not be particular to half-a-pint how much you give; I have given it in large quantities—in some cases they have almost passed pure oil without any injurious effects. Enemas of warm water should be frequently administered. Kneading the bowels and back-raking are very beneficial; I am confident I have saved many a life by doing this.

Colic

is of two kinds, Spasmodic and Flatulent. They are diseases which arise from many causes, such as improper food, change of diet, physic when the animal has not been properly prepared, a sudden chill caused by allowing the animal when heated to stand in a draught, getting the legs and belly wet during the winter months, exhaustion, particularly if associated with long fasting, and cold water if given to the animal when sweating after a long journey. Flatulent Colic is generally due to food which easily undergoes fermentation, such as boiled corn and green food, the latter especially if cut damp, tied up in bundles and allowed to remain in the stable until wanted; it then becomes heated, often so hot that you can hardly bear your hand in it. I have seen many fatal cases from this cause. In one case the horse had given to it half a bundle of grass which had lain tied up since the previous day. It hadn't eaten the half before it was attacked with acute Flatulency, and died within twenty minutes from taking the first bite. I believe the *post-mortem* examination showed ruptured stomach. Symptoms of Spasmodic Colic are sudden pain, endeavours to kick the belly, looks round at the flanks, and in some cases attempts to bite its sides, suddenly falls down, rolls, throws itself violently about, gets up and lies down rapidly and frequently; whilst the spasm lasts, the breathing is hurried and the pulse rises often to a hundred or more, but when it passes away both breathing and pulse fall to their natural standard. The fæces are sometimes hard sometimes soft, and generally passed at the beginning of the attack; the urine is passed in small quantities, or there are frequent ineffectual attempts at urination. These symptoms, unless relieved, terminate in Enteritis.

Treatment.—Knowing that the pain and spasms are due to the presence of some irritant, the removal of this will effect a cure. This is best done by administering opening medicine combined with sedatives; when there is acute pain opiates are to be given, and they may be given in large doses; opium is generally used and is best given in a ball. In my opinion ordinary doses of opium in acute cases like these are like pouring water on a duck's back; I have given large doses with the greatest success, one large dose at the beginning is, I think, much better than small doses often repeated, because the longer the pain and spasm lasts there is a greater tendency to the case terminating in inflammation. The large dose generally acts immediately, throws the bowels into a state of collapse, relieves the pain and spasm, the poor animal lies down and gets a comfortable sleep, often sleeping for four or five hours, and waking up all right.

In one case I gave as much as ten drachms of powdered opium in twenty minutes. I gave it in two balls, the first containing six drachms, and the animal being no better, in twenty minutes, the pain being very acute, I gave the second ball, containing four drachms. Even this did not put it to sleep, simply relieved the pain, the animal gradually recovered and apparently suffered no ill effects from the large dose. In all cases, after the acute pain has passed, I usually give linseed oil to remove any irritant and to counteract the constipating effects of the opium. In the milder attacks I have had very good results from giving chlorodyne (ʒiv. to ʒviii.) made into a ball with soda

bicarb.; of the different kinds of chlorodyne, I prefer Hewlett's, it being more uniform. Those gentlemen who have not tried it I would strongly recommend them to do so. Warm water enemas should be repeatedly administered, and hot fomentations applied to the abdomen. In all cases the bladder should be examined, and if full, the catheter passed. In Flatulent Colic the pain is not so acute but more constant, the abdomen is more or less distended, breathing difficult, nostrils dilated, pulse quick and feeble, walking round and round the box, frequent attempts to lie down, and when the animal does lie he does so cautiously, seldom or never rolls, and gets up immediately. In the latter stages the extremities become cold, there is more or less delirium, twitching of the muscles, reeling to and fro, and if not relieved death generally ensues from rupture of some portion of the intestines.

Treatment.—I have been most successful with linseed oil, turpentine or ammonia, enemas, and hot fomentations to the abdomen. Kneading the bowels does good and should always be resorted to. Some practitioners recommend puncturing the colon, especially our friends across the Atlantic; this operation I have never tried.

With this, gentlemen, I ought to finish, but as many diseases of the bowels terminate in inflammation, I will with your kind permission give you my ideas upon Enteritis, concerning which, I have no doubt, there will be various opinions. Undoubtedly we often have cases of inflammation of the bowels, which I consider only secondary. A great many acute cases of Colic are often said to be Enteritis which, unless immediately relieved, terminate in inflammation. In my opinion, when inflammation sets in it always terminates fatally. I am open to correction, and will gladly admit my error if any gentleman will prove to me that these cases are curable. I have no doubt there are many here who have thought (if I may be so bold to say so) that they have treated such cases successfully. I have no doubt these successful cases have been very acute cases of Colic, and have only pulled through it by the skin of their teeth. Fortunately for the animals, we cannot get inside to see the exact state of affairs, but when they die we always find the bowels in an awful state, black and congested, and the exudation so great that it is often half-an-inch or more in thickness. These are the reasons why I contend Enteritis is incurable; in all cases of inflammation we get congestion and exudation, consequently, to a certain extent, loss of vitality of the part or parts affected, gangrene and sloughing setting in so rapidly that it carries the patients off before nature gets a chance at recovery.

With these remarks I will conclude. This paper contains many imperfections which I hope, gentlemen, you will kindly overlook. I trust I have said that which will provoke discussion and tend to the establishment of truth. I have stated freely and with little regard for the opinion of others my own views of the subject. We are all prone to err, and if it can be proved that I am on my part mistaken, I shall not be loth to acknowledge it, for we lose nothing in eliciting truth.

A very animated discussion followed the reading of the paper, as to whether linseed oil or aloes was the best aperient to give in cases of diseases of the bowels requiring opening medicine, in which Messrs. H. Hunter, Macgregor, A. L. Butters, Corbett, A. Hunter, Anderson, Hedley, Mulvey, Stephenson, and the president took part.

A vote of thanks having been proposed and carried unanimously to Mr. Elphick for reading his paper, and to the President, the meeting terminated.

G. R. DUDGEON, *Hon. Sec.*

Army Veterinary Department.

THE *Army and Navy Gazette* announces that the new Veterinary Warrant is now before the Treasury, but that it is to be feared the document, when it makes its appearance, will be disappointing to the members of the Department, great care having been taken by the officials in Downing Street to curtail expenses—the War Office having experienced considerable difficulty in obtaining money to enable it to remove the anomalies, the existence of which constituted the principal cause of complaint against the previous Warrant.

It is also announced that a number of veterinary surgeons heading the list of the 1st Class, have made known their intention of retiring from the service on completing twenty-five years' service ; and on the understanding that they will withdraw, they have been permitted to remain on home service instead of taking their tour of India. The Principal Veterinary Surgeon is most anxious to open a prospect to the younger members of his department, and to allow no such thing as favouritism to exist at Winchester House.

Obituary.

THE death is announced of Veterinary Surgeon W. F. Blanshard from Cholera, on the 16th August, while on duty with the D-2 Battery, Royal Artillery, in Afghanistan. Deceased graduated in 1879, and obtained his commission in the army on August 2nd, 1871 ; he had served with the Kandahar field-force in the recent operations.

The Registrar of the Royal College reports the demise of Mr. J. Gillespie, late of Alloa, who graduated in 1869 ; and Mr. W. Shaw, of Stranraer and New York, a graduate of 1876.

Notes and News.

RABIES IN DOGS.—A contribution to our knowledge of this disorder has been recently made, says the *Comptes Rendus*, by M. Galtier. The most important of the conclusions which he draws from his experiments, is that the saliva of a mad dog, obtained from the living animal and kept in water, continues virulent for five, fourteen, and even twenty-four hours afterwards. This fact has consequences of which everybody should be aware. Thus it seems that the water of a vessel in which a mad dog may have dropped some of its saliva in attempting to drink, should be considered virulent during at least twenty-four hours; and next, that as the saliva of a mad dog which has succumbed to the malady, or has been killed, does not lose its properties through mere cooling of the body, it is important, in examining the cavities of the mouth and throat after death, to guard against the possible danger of inoculation. M. Galtier tested rabbits with regard to Rabies, and found it transmissible to them from the dog ; also, the rabbits' Rabies from them to animals of the same species. The chief symptoms are paralysis and convulsions. The animal may live from a few hours to four days after the disease has declared itself. It is notable that the period of incubation is much shorter in the rabbit than in other animals, and this makes the rabbit a more useful reagent for determining the virulence of a particular liquid. M. Galtier found salicylic acid, injected daily under the skin, powerless to prevent the development of the disorder in rabbits.

THE TRANSMISSIBILITY OF SPIRILLUM FEVER BY INOCULATION.—Dr. Carter, of Bombay, announces that the Spirillum Fever of that Presidency (which is due to, or associated with, the presence of a microscopical vegetable organism in the blood)—a fever identical with famine or relapsing fever, or *Typhus recurrens*—may be readily communicated to the *Macacus radiatus*, a common quadrumanous inhabitant of the Bombay forests, by inoculation of the blood of a fever patient. He has successfully repeated the experiment, as well as the similar one of inoculation from one monkey to another, upwards of a dozen times, and has met with only one, or at most two, failures in reproducing the disease, which, for the most part, had been unequivocally manifested by both marked general symptoms and abundance of the attendant blood parasite. The *post-mortem* appearances, also, were equally concordant.

THE AMERICAN SWINE TRADE.—The Toronto *Globe* remarks: "It does not follow that the trade in live hogs between the United States and Britain has received a death-blow. On the contrary, it only needs facilities for slaughtering, and a thorough organization of the means for distributing the meat and offal, to render the trade almost as profitable as if the animal was allowed to go inland alive. In fact, the market for the waste and inferior products of the hog is so much better in England than Chicago that we question if Liverpool might not be supplied with Western hogs, and made a great centre of the packing trade.

EXTENSIVE POISONING BY WATER-HEMLOCK.—A fatal case of cattle poisoning occurred a short time ago in Brittany, a mention of which may be of serviceable warning to some of our readers. The so-called water-hemlock, *Cicuta virosa*, is very generally distributed throughout the whole of Europe, growing chiefly on the banks of brooks, ponds, and swamps, but is rarely regarded as a source of danger to cattle, as these very seldom appear to touch it. In the case above mentioned, however, a herd of fourteen milch cows fed upon the weed with fatal effects, eleven of them dying within a few hours, while the remaining three were rescued only with great difficulty.

CATTLE IN THE UNITED STATES.—The Omaha *Journal of Commerce* of July 21st says: "The cattle drive of the present season from Texas and the south-western ranges is placed at 250,000 head. From Montana and Oregon our estimate places the drive of 1879 at 100,000 head. The drive of Texas and Indian territory cattle and ponies, reaches Ogallala in June, towards the latter part of the month and continues to arrive during July. Kansas was formerly the northern limit of the drive, and this gave to Kansas City a considerable advantage as a market; but the proportion of the stock remaining in Kansas is yearly decreasing, while that of Nebraska and Wyoming is annually increasing. At Ogallala, on the Union Pacific, is now found the great cattle rendezvous which formerly ended at Abilene, on the Kansas Pacific. Our advices from Ogallala are not up to date, but a week since the arrivals had reached 75,000 head, and it is fair to estimate them at 100,000 head at this point alone. Besides the Texas drive, the mountain drive, of 100,000 head, will reach the Union Pacific, and this route will soon become the greatest stock thoroughfare in the world. The demand for feeders in Nebraska and Iowa is already very great, and the Omaha Live Stock Market is soon to become an important object of interest between the rival Chicago and St. Louis lines, when the new Wabash and St. Louis lines reach Omaha." The same journal also states that the cattle drive is yearly drifting further northward, and the best grounds are now found north of the Union Pacific. This explains why Omaha is rapidly gaining, and Kansas City falling off in cattle receipts—the loss of the latter point being 40,000 head in 1878, com-

pared with 1877, while the gain at Omaha has averaged 25,000 to 30,000 a year.

THE *Idaho Statesman* says, that "Immense herds of cattle have been purchased in Eastern Oregon, and are now being driven across the Snake River and through Idaho to the eastern markets. There are several herds of these cattle, ranging in number from 10,000 down to 1,000, many of which will ultimately reach this market. It is stated that of the cattle coming from Oregon, and those leaving Idaho, not less than 100,000 head will be driven east this season. This cattle trade is constantly increasing; and it is safe to say that from this source alone the railroad, when built, would derive a trade worth nearly 1,000,000 dollars annually. People are just beginning to awake to the immense value of the magnificent cattle ranges, which cover a large portion of Idaho and Eastern Oregon. Purchasers are being attracted to that region by the superior quality of the beef, and the comparatively easy terms on which cattle can be bought. With an advent of the railroad this country will receive a new impetus, as the cattle can be taken on cars to the eastern markets or to the various herding-places along the route. The importance of this trade in the future to Chicago can hardly be estimated, for Chicago is bound to secure the lion's share of it."

FOUR MILLION THREE THOUSAND THREE HUNDRED head of cattle now roam the Texan ranches. New York follows in point of numbers, with a bovine population of 2,100,400. California leads in sheep, with 6,670,600.

POISONING BY URINE.—The following case is recorded by Gavard in the *Journal de Médecine Vétérinaire* for May, 1879. A young ram which had acquired a habit of going upstairs into the house every morning, as soon as the doors were opened, to get what it could to eat from the residents, one morning drank off, before it was observed, the whole contents of a large vessel in which the urine from the different bed-chambers had been collected for the purpose of emptying it away. The animal was immediately seized with violent general tremor; the head was outstretched stiffly, the aspect staring, and the gait staggering, so that it could scarcely stand. As these symptoms gradually increased in severity, the stomach swelled enormously, and the breathing became more and more difficult. In little less than an hour the ram was dead. Half an hour after death, Gavard found the carcass strongly "meteorized," the ocular conjunctiva coloured blue, and thick, black, tarry blood flowing from the nostril. In a very short time further the carcass gave out such a horrible stench that the owner ordered it to be buried at once, whereby the opportunity of a *post-mortem* examination was lost to the veterinary surgeon in charge.

TRICHINOSIS IN ITALY.—So long ago as the 18th February last, a special meeting of the Royal and National Veterinary Society of Italy was held, to receive a communication on the subject of Trichinosis, from Signor Volante, the municipal veterinary surgeon of Turin. In this communication Volante stated that *trichinæ* had been discovered in American hams sent from Cincinnati, and sold at Turin, four per cent. of the hams being infested. The Society addressed a memoir to the Minister of the Interior—to whose charge the sanitary service in Italy is confided—with regard to the general measures to be adopted for the protection of the public from the dangers attending the consumption of American pork which is sold throughout the Peninsula, and urging the necessity for compelling the municipal authorities of towns and cities, who had not already done so, to organise a meat inspection service.

CONTAGIOUS CARBUNCULAR ERYSIPELAS IN AMERICA.—The Rocky Mountain *Husbandman*, says "Blackleg," is rife in Montana herds, and there is

a fear that it may spread to every valley in Montana, and may become a serious obstacle to the cattle-growing interest.

HYDROPHOBIA IN MANCHESTER.—Mr. Southam, resident surgical officer in the Manchester Royal Infirmary, in a communication in the *Lancet* for September 6th, states that five cases of Hydrophobia had been treated there during the last twelve months—all of which proved fatal. One was treated with subcutaneous injections of chloral hydrate and morphia, one with chloral alone, one with curara and morphia, one with morphia alone, and the last with curara and the hot-air bath. Curara is, he thinks, a very dangerous remedy, while the other drugs merely mask the symptoms by narcotising the patient, and before this object can be attained they have to be administered in large and almost dangerous doses. Mr. Southam gives the preference to the hot-air bath, from the relief it affords to the patient and alleviation to the symptoms it at once afforded in the case in which it was resorted to.

UNUSUAL DURATION OF RABIES' INCUBATION IN THE HORSE.—In the *Wochenschrift für Thierheilkunde und Viehzucht* for May, Veterinary Surgeon Gotteswinter relates a case of Rabies in a horse, the period elapsing between the bite from the rabid dog until the symptoms first appeared being twenty months! The circumstances were so marked that there does not appear to be any mistake with regard to this extraordinarily protracted period of latency.

GESTATION AND BREEDING OF THE ELEPHANT.—The period of gestation in the elephant is said by experienced natives to vary as the calf is male or female, being twenty-two months in the case of the former, and eighteen in the latter. I cannot, of my own observation, afford conclusive proof that such is the case, though I believe there is some truth in the statement. I have known elephants to calve twenty months after capture, the young always being males when eighteen months were exceeded, and it was not known how long the mothers had been in calf before capture. The female elephant receives the male again about eight or ten months after calving. . . . Female elephants usually give birth to their first calf at sixteen years of age, sometimes at thirteen or fourteen, but are then palpably immature themselves. I have heard of what appears to be a well-authenticated case of a female elephant having two calves at a birth. Many wild female elephants are accompanied by two, sometimes three, calves of three degrees. Elephants breed about once in two-and-a-half years. Two calves are usually sucking at the same time; and I have even seen the eldest of three—a young elephant five-and-a-half feet high, and about five years old, that had to stoop to reach its mother—suck occasionally. I need hardly say that the young elephant sucks with its mouth, not its trunk. Calves usually stand exactly three feet high at the shoulder when born; the trunk is then only ten inches long, and possesses little flexibility. The average weight of several calves I have weighed on the second day after birth has been 200 lb. They live entirely upon milk till six months old, when they eat a little tender grass; their chief support, however, is still milk for some months. . . . The elephant very rarely breeds in confinement, but this is owing to the segregation of the sexes, and also to the physical causes of insufficient food or hard work. It would not answer from an economic point of view to breed elephants in India, as, before they were of a useful age—fifteen years—they would have cost more than would suffice to capture a number of mature wild ones, ready for work. It is said that they are bred in a semi-wild state, and with little expense, in parts of Burmah and Siam. The females there are shackled and left at large in the forests during the non-working months, where wild males have access

to them. But in Burmah fodder is plentiful, and the young stock cost nothing till taken up for sale. . . . . There is ample proof that it is not the male elephant that comes into season. In following single males with a view to capturing them with trained females, they may always be relied upon to make advances to the females, usually to some particular one, and the efforts of the mahouts are frequently necessary to keep her out of the male's reach. The period of heat is not marked by any particular signs in the female, which has probably helped to strengthen the erroneous opinion spoken of. In approaching a male elephant, a female desirous of his attentions utters certain sounds, and courts his society; but only those conversant with elephants would notice this. It has frequently happened that the tame females of the Kheddah parties have been found in calf after work in the jungles, where wild males have had access to them, though no indications of their being prepared to receive the male were observed, even by their keepers. It has been a disputed point as to the manner in which the connection between the two sexes takes place. Some have supposed that the female kneels or lies down to receive the male, but this is not the case. I have myself on four different occasions witnessed the act, once by two animals belonging to a wild herd in the jungles; on the others, by animals which had just been caught, and which were at large within the Kheddah enclosures. On each, the female elephant stood to receive the male in the manner common to all quadrupeds. The opposite opinion may have arisen from the fact that it is possible for a heavy male to bear down to her knees a female much smaller than himself.—*Thirteen Years among the Wild Beasts of India.*

DUMB ANIMALS AS PATIENTS.—We have often been struck with astonishment while witnessing the patient submission of animals, especially dogs and horses, to surgical operations, and to the surgical dressings necessitated by them. A case in point has been brought under our notice. A fine pointer bitch had a large, hard, fibrous tumour of the breast, with deep, far-reaching roots. The operation for its removal was very skilfully and effectually executed by Mr. George Fleming, veterinary surgeon of the 2nd Life-Guards. During the operation the animal displayed an amount of patience that would have been creditable in a human being. Even during the most painful part of the proceeding—that of inserting sutures—she never flinched. The same resignation was displayed when the time for dressing the wound came round. The patient received the surgeon with an air of preparation, and even put herself into position for being dressed. In the case of a similar operation on another dog, some years ago, strong resistance was offered to the attempt to give chloroform; but the animal submitted to the surgical procedure as we have described above. Such facts admit of a partial explanation in the mental theory of pain, according to which, suffering that is not anticipated and mentally apprehended is not pain in the acuter sense of the word. But we should be sorry to see this explanation carried so far as to deprive our dumb fellow-creatures of all credit for the submission they show under surgical treatment. We would go farther, and say that they are vastly more sensible than many human beings in their estimate of the medical profession, and have instinct enough to see that even when pain is inflicted on them, it is for a good and kind purpose.—*The Lancet.*

Correspondence, etc.

THE FITZWYGRAM PRIZES.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—I hoped to see in your last issue some remarks with reference to the conclusions which General Sir F. Fitzwygram announced, at the last quarterly meeting of the R.C.V.S., with regard to the competition for the prizes which he generously offers every year. But failing to find them, I venture, with your permission, to try and point out what seems to me to be a great mistake or oversight. It is stated in the report of the meeting, that next year the competition for the prizes will be limited to those graduates who passed with *Great Credit*, but would be extended to members of the Royal College of Veterinary Surgeons who had held their diploma not more than two years, instead of one year as heretofore. The number of marks necessary to pass from the first to the second stage of the competition would be raised from fifty to seventy-five per cent. on the numbers allotted to each subject. The advantage of the latter change I think no one will dispute, as it is a fair standard for the student, since his period of tuition has extended from three to five sessions. Therefore it is quite natural for the respected donor to expect an equivalent advance in knowledge. Also allowing students to compete within two years after they have received their diploma, is no doubt an improvement; although at first sight it might seem a little unfair to a newly-fledged member, still I think that, practically, it will not be found to be so, while at the same time it will leave a larger margin to obtain candidates from. With regard to the first part of the notice, viz., that the candidate will be limited to those who have passed with honours *(Great Credit*, etc.), I wish, with all due deference to our liberal benefactor, to make a few remarks. First of all, we ought to consider how the distinguishing honours "with credit, etc.," are obtained. The examination, as we are all aware, is a verbal one (with the single exception of scribbling a certificate as to soundness), limited to a short time for each subject. Now, if one looks at this in a straightforward manner, can we honestly say such a one-sided examination as this can test any student's abilities? I think most of us will answer in the negative; for we are not all gifted with the same amount of confidence and frankness. In fact, I remember when I attended the "private classes" in Camden Town that there were men who answered the questions given to them in quite a different manner (and even falsely) to what they would have done, had they been in one of their fellow-student's rooms. If this be so, before a *teacher* with whom they are more or less familiar, how much more nervous and timid would they be when answering *strangers?* Added to which, no responsibility, as it were, rested upon their answer in the one case; whereas in the other it did, consequently making the student more cautious how and what he says. Some persons will say, "Oh, but he knows his diploma is at stake in one instance and not in the other, and he is sure to keep his wits about him." But my experience (which no doubt is very little) is the opposite, for the more responsibility some men have the better they wish to do things, and the more they try so the worse they are off. There is another fact, viz., they know they have only a very short time to answer their questions in; therefore they try to answer every question that is put to them, and they often receive questions upon subjects in which they know they are *weak*, and if they receive a question they know nothing about they are too timid to say, "I don't know," which if they did say, would allow the examiner to take them at once to another subject where they might be quite "at home," and so gain the requisite number of marks in the allotted time. But no; the poor student is too shy,

or he thinks it is degrading to tell his examiner straight out that he is ignorant upon any subject; so he goes on hesitating until he exhausts his examiner's patience, and is hurried, perhaps rather impatiently, on to a fresh subject, thinking all the time that he is certainly *spun*. Consequently, in his confusion he cannot do justice to himself or his examiner, and he finds the bell rings before he has had a chance to recover himself. If this should unfortunately occur at his *first* table, he is utterly unnerved at the others, and finds when the roll is called that his name is absent; or if not, he certainly does not have the cheering words passed with "credit," "great credit," or "very great credit," added to it when he receives his diploma. Although it is possible that he may have known the subjects as well as those who passed with honours, still he could not distinghish himself, because the examination was conducted in a manner which did not suit him. Therefore I maintain that by our present method of examination it is hardly possible to *class* the men who present themselves, and in my humble opinion no stress or distinguishing mark ought to be put upon them, so as to prevent them from competing for the prizes offered, so long as the examination remains purely verbal. I should, consequently, be very glad to see the words "with credit," etc., expunged from the rules for all prizes which are offered to members of the R.C.V.S., until our examinations are (what may I say?) *worthy* of classing its students. I think no examiner or teacher would say that an oral examination for so short a time is sufficient to obtain a trustworthy knowledge of the abilities of any student, more especially as they do not all have the same questions to answer. In order to fairly and honestly class the men for any examination, they ought to receive the same questions (or as near as possible), and this can only be done by having a *written* as well as verbal examination. I have no doubt that Sir Frederick Fitzwygram put the words in his rules, with his usual wish of advancing our students, but I think if they are retained there will be many good and worthy men excluded from the competition.

I am, my dear Sir,
Yours, etc.,
"A First-Prize Winner."

THE CASTRATION OF CRYPTORCHID HORSES.

To the Editor of the Veterinary Journal.

Dear Sir,—By the permission which you have kindly extended to me, I now make some statements and observations in reference to questions that are repeatedly asked of me by members of the profession in this country.

I have travelled six thousand miles in England, Ireland, Scotland and France this year, in compliance to demands for my services in my specialties. I have castrated ninety "rigs," and quite a number of entire colts and horses from four weeks old up to twenty years. I have also spayed some cows and bitches, and caponed hundreds of spring chickens. Of course, I had to meet thousands of strangers, and am pleased to say I made many very pleasant acquaintances, and feel that many of them are dear friends whom I am under many obligations to for much kindness shown me—a stranger.

In availing myself of the opportunity you have afforded me to make some remarks on the subject of castration, I think it will be most satisfactory to state the kind of questions usually put to me by veterinary surgeons, and give my replies to them. They are as follows:—

Question.—At what age is it best to castrate a colt?

Answer.—I think at from two to four months old, because it is then easier handled.

Q.—Is it safe to castrate very old horses?

A.—I think age makes no difference, if they are healthy and are handled mercifully.

Q.—At what age do you castrate your own colts?

A.—While they are sucking; for I think it makes them finer in the head and neck, larger in the hips, and more saleable.

Q.—Can a colt castrated so young undergo hardship when full-grown, like one castrated when four or five years old?

A.—No.

Q.—Why, then, would you castrate so young, and thereby impair the endurance of the animal?

A.—For economy's sake. It costs too much, generally, to keep him—a restless stallion—for two or three years.

Q.—How can I obtain the toughest and most enduring horse the cheapest way out of my colt?

A.—Castrate your colt when young; feed him well; and when grown, sell him, and buy a "double rig" with about half the money.

Q.—What is a "double rig" horse?

A.—A horse with two unnaturally located testicles.

Q.—Can such a horse get a colt?

A.—No; if both testicles are in the abdomen he cannot propagate.

Q.—Can any "rig" sire a colt?

A.—Horses with one healthy testicle down naturally are as sure foal-getters as when both are down.

Q.—Does a "rig" stallion get many colts like himself, with one testicle up and one down?

A.—He will get some most likely, but I am not able to fix a percentage, for some will get more than others, even to twenty-five per cent. sometimes.

Q.—How do you account for "double rigs"?

A.—My inquiries about such lead me to believe that mares sired by "rig" stallions, and bred to "rig" stallions, are much more liable to bring "double rigs" than those which are not.

Q.—Is it of service to take out one testicle when both are not down?

A.—Yes, it is; no, it is not. It will stop his breeding, but he will squeal and be as troublesome as ever.

Q.—How many kinds of "rig" horses are there?

A.—I tell my pupils there are five.

Q.—What are your terms for instruction in your method?

A.—I charge veterinary surgeons in England nothing as a fee, but require them to collect for me to castrate some stock in the class that they wish my methods demonstrated upon, and they are expected to help me do the work. If it is colt castration, six colts; if it is "rig" castration, six "rig" horses; and the written obligation of the veterinary surgeons not to divulge my methods of "rig" castration for five years.

Q.—Why do you wish this kept secret?

A.—Because I would do England a great wrong to make my methods of "rig" castration public, and not fully instruct, which I cannot do. Half the success of "rig" castration consists in properly casting and securing, and I cannot tell or teach that without the subjects to operate on. Men half instructed would kill much stock, and then stop for want of patronage; and I would get no thanks, but much blame, while unnecessary cruelty would be inflicted on animals, and "rig" castration would be called a failure.

Q.—How do you castrate ordinary colts and horses?

A.—Nearly every way I ever heard of. I prefer to cast and secure them lying, as that position is better than standing up. I like a small hook to open the scrotum with, two incisions being made, and I prefer a good ecraseur to take both testicles off at one time, this being better and less painful than any other method.

Q.—How often have you used the ecraseur?

A.—Almost constantly for nine or ten years, both in winter and summer.

Q.—How do you manage to stop the hæmorrhage?

A.—I let it stop of itself.

Q.—Don't some bleed to death?

A.—No.

Q.—Don't you have some secondary hæmorrhage?

A.—Yes, one in fifty or seventy-five castrations.

Q.—How do you do then?

A.—I stand and look at it, and tell the owner I can stop it in two minutes if he will cast the horse, but advise to wait a little longer.

Q.—How would you stop a bad case?

A.—By either ligature or the ecraseur—the latter being put on the cord a little above the part where the bleeding is, which is then slightly crushed. This is the best plan. I have not cast but one horse in twenty years to stop hæmorrhage, and that was unnecessary work; and I think plugging the scrotum is unnecessary if the operator is not scared too much to be still a little longer.

Many years ago I would get uneasy about much bleeding. Since then I stop it by faith in nature and a good ecraseur.

Q.—How do you keep a horse from swelling after the operation of castration.

A.—By having the scrotum frequently opened, and ordering constant work or exercise.

Q.—Do all horses require that care?

A.—No, only a few.

Q.—What season of the year is best?

A.—All seasons, I think, are alike for safety. I offer insurance on all, at any time, and allow the animals to be worked every day after the operation. But I would advise that colts be kept from a cold chilling wind when they are so sore that they will not voluntarily take exercise and warm themselves.

Q.—How would you remove the soreness?

A.—By exercise only—the "movement cure."

Q.—How do you treat a Schirrus cord?

A.—If it is large—say five or six pounds, or more—I cut down on one side to the cord, dissect it out from the tunic as high as it is much swollen, and take it off with the ecraseur. I have removed one weighing eleven pounds, and I think the horse lost two gallons of blood; yet it got well in a short time. Along with the tumour, at the bottom of it, I removed some skin about the size of a common plate.

Q.—Why do you say so much about caponing fowls, it is an old operation here?

A.—Because I think it is as important as to castrate male pigs. The greatest delicacy we can get in flesh is so easily obtained that way and is much neglected in England, where good flesh is appreciated.

Q.—If your advice was asked in the interest of the profession, what would it be as a castrator?

A.—I would say do not tie the horses' hind feet up to his shoulders, for that is dangerous to the back, but tie to the hips and leave the back free. Do not use a long nose-twitch, which is cruel. A short one tied on in moderation does more good with less pain, I think. Socially, I would advise you to say no hard things against any M.R.C.V.S. Outsiders will do that enough. Financially, if opposition in competition is strong, sell out to the competition, move to almost any part of Central United States of America, and you will do well. I have travelled much in both countries, we are one people, but in America any M.R.C.V.S. would have plenty of room and business if he is a worthy and steady practitioner. Yours truly, "FARMER MILES."

PROFESSIONAL UNITY.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—As a H. and A. S. certificate holder, I, like many more in the North of Scotland, have been, through the medium of your valuable Journal, frequently informed of the agreement come to between the Society and the Royal College of Veterinary Surgeons, by which certificate holders are to be registered as M.R.C.V.S. Something was also said of granting a diploma on payment of the registration fee. Now, sir, as all this information is becoming a thing of the past, and no intimation has as yet been given to certificate holders when or where to apply for the proposed diploma, you would be dispelling a mystery from the minds of your professional brethren in the North, by throwing some light on this subject. Trusting you will kindly afford me space in the next issue of your Journal for the above, as it will not, I think, be uninteresting to the profession generally.

Your obedient servant,

"A NORTHERNER."

[We are sorry we cannot afford our correspondent any information on this matter, but it is probable something will be elicited regarding it at the next Council meeting of the Royal College on the 2nd instant.]

COMMENTS.

THERE is nothing more remarkable in connection with disease than the strange notions entertained by many people with regard to Rabies and Hydrophobia, and there can scarcely be a doubt as to the dangerous tendency of some of these notions. They are held, however, by persons who have had no experience of the malady, and whose ideas with respect to it are consequently vague and unformed. Among these notions is that of the non-contagiousness of Rabies, and that Hydrophobia is the product of imagination. It is forgotten or unknown to these people that Rabies can be transmitted, experimentally, from one animal to another—animals unconscious of having been inoculated, and which have little or no imagination. But we trust that no member of the veterinary profession is now-a-days possessed of such nonsensical and hazardous opinions, and we are glad to notice that the name of the writer of the annexed letter, who evidently knows nothing of the disease, nor, it would appear, of other animal disorders communicable to man—especially those of a febrile character—is not to be found in the Register, albeit he affixes V.S. to his name. In the Editorial for last month we gave the history of a lamentable case of death from Hydrophobia in Dublin. The letter, which we reprint literally, appeared in one of the Dublin newspapers, *apropos* of that case.

HYDROPHOBIA.

"*To the Editor of the* FREEMAN.

"Mulingar, 16th *August.*

"SIR,—Having read from time to time of late from different parties letters in the public print on Hydrophobia in dogs, and its being communicated to man by being bitten. In my opinion such letters are only calculated to do much more harm than good. Hydrophobia in dogs is nothing more nor less than 'meningities,' 'inflamation of the membranes of the brain.' It is a well-known fact that no kind of fever can be communicated from the lower animals to the human subject, and Hydrophobia in dog is simply brain fever. Most medical men say that virus is introduced into the wound from the dog's teeth, but at the same time they say they cannot tell where the virus comes from. There is no such thing as virus on the teeth nor mixed in the saliva of dogs suffering from 'rabis,' unless that the animal has been mouthing some

foul thing immediately before the act of biting; and suppose such to be the case, the virus introduced into the bite would cause blood poison, a disease altogether different in every symptom of Hydrophobia. How is it that out of every fifty persons bitten by rabid dogs only about one dies of what is called Hydrophobia, the which I believe to be entirely brought about by imagination? With regard to the treatment of the bite, and to save any unpleasant consequences whatever, as I said, in case the animal has been mouthing any foul thing, a good caustic dressing to the wound and a dose of physic is quite sufficient to prevent any unpleasant symptoms. DAVID FULTON, V.S."

A LITTLE cardboard box has been forwarded to us with a label thereon, purporting that it comes "From the Royal Canine Hospital, 55, South Molton Street, Bond Street," and thereto is added "Mr. Rotheram, R.V.C.S." We are asked whether that person is a member of the veterinary profession, and the significance of the letters appended to his name. We can only state that there is no such name as Rotheram in the Register of the Royal College, and that we are unable to explain the purport of the mystic *addenda*, unless to lead the public to believe, from their similarity to M.R.C.V.S., that he is not a quack but an educated veterinarian. Such devices are far from uncommon, and they generally serve to delude the unwary.

ANSWERS TO CORRESPONDENTS.

A SUBSCRIBER.—The bullocks died from Anthrax. You do not allude to the state of the spleen. It is extremely probable that the attack was due to drinking the stagnant water on the common. You might have tried the administration of carbolic acid.

SANITAS.—You will find the subject treated in the editorial of the present issue.

MR. FROST, Army Veterinary Department, Rangoon, is heartily thanked for sending the elephant's eye for microscopical examination of the retina, and for carefully preserving it according to the directions given in the Journal, Vol. vii., p. 292.

Communications from F. Smith, A. E. Queripel, J. W. Hill, J. Gerrard, and Professor Walley are unavoidably held over until next month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from M. Hedley, Dublin; T. Campbell, Kingston; "Vertute et Labore"; W. Marshall, Glanton, Northumberland; W. F. Anderson, Warwick; H. Darley, Windsor; G. A. Banham, London; "A First Prize Winner"; Professor Walley, Edinburgh; D. Hutcheon, Liverpool; W. Pallin, 20th Hussars, Manchester; J. D. Overed, Blofield; F. Walker, 7th Hussars, Newbridge; R. Ward, London; G. G. Whincop, Norwich; F. Miles, London; J. W. Hill, Wolverhampton; J. Shivas, Invergordon; J. Gerrard, Romford; G. R. Dudgeon, Sunderland; "A Northerner."

BOOKS AND PAMPHLETS: *Stockfleth and Steffen*, Handbuch der Thierärztlichen Chirurgie; *Dr. Anacker*, Die Knochenbrüchtigkeit der Rinder; *Dr. Dubonè* De la Physiologie Pathologique et du Traitement Rationnel de la Rage; Annual Catalogue and Announcement of the Columbia Veterinary College for 1879.

JOURNALS, ETC.: *Wochenschrift für Thierheilkunde und Viehzucht; Archives Vétérinaire; Recueil de Méd. Vétérinaire; American Live Stock Journal; Journal de Médecine Vétérinaire et de Zootechnie; Lancet; Der Thierarzt; L'Echo Vétérinaire; Live Stock Journal; Journal of the National Agricultural Society of Victoria; Melbourne Chemist and Druggist; Agricultural Gazette; Mark Lane Express; Farmer; Œsterreichische Vierteljahr. für Wissenschaftliche Veterinärkunde; Revue Vétérinaire; Schweizerisches Archiv f. Thierheilkunde u. Thierzucht; Medical Press and Circular; Nature; American Veterinary Review.*

NEWSPAPERS: *Freeman's Journal; Montreal Daily Witness; Scotsman; Glasgow Herald; Manchester Guardian; York Herald; Lahore Civil and Military Gazette; Madras Mail; Albany Country Gentleman.*